Danaher Motion

SERVO**STAR**® PD

SERCOS IDN Reference Manual

KOLLMORGEN

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Copyright Information

NOTICE:

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Configurable I/O: Input 2 Status
Configurable I/O: Input 3 Status
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Configurable I/O: Inputs Polarity
Configurable I/O: Input 1 Mode
Configurable I/O: Input 2 Mode
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System Load Limit
Weight Counter Balance
Current Loop Adaptive Gain at Peak Current
Current Loop Adaptive Gain at Continuous Current
Current Loop Adaptive Gain at Zero Current
Torque Angle Advance at Continuous Current
Torque Angle Advance at Peak Current
Additive Torque Command
Bipolar Torque Limit
Amplifier Rated Current
Friction Torque Compensation
Overload Warning
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Maximum Motor Speed
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Motor Back EMF Constant
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Current Loop Adaptive Gain at Continuous Current
Current Loop Adaptive Gain at Zero Current
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Position Control

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Acceleration Feed-Forward Gain
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Absolute Mechanical Position Relative to Marker
Micro-Interpolator Mode
Position Loop Derivative Gain
Position Loop Integrator Output Saturation Limit
Position Loop Integrator Input Saturation Limit
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Home Switch Status
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Probe 1 Positive Edge Latched Status
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Systems Communication

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Velocity Control

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Bipolar Velocity Limit
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Velocity Angle Advance at Half Speed
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Velocity Data Scaling Type
Velocity Loop Proportional Gain
Velocity Angle Advance at Maximum Speed
Motor Over Speed Trip Set Point
Velocity Notch Filter Center Frequency
Velocity Feedback Compensation Filter
Velocity Low Pass Filter 1 Frequency
Velocity Loop Compensation Mode
Velocity Loop PDFF Integral Gain
Velocity Loop SPP Bandwidth
Velocity Loop SPP Tracking Factor
Velocity Loop Expanded Proportional Gain
Velocity Loop APP Forward Path Polynomial
Velocity APP Feed-forward Path Polynomial
APP Velocity Controller Procedure Control
Step Velocity 1
Step Velocity 2
Procedure: Velocity Step

SERCOS IDNs

Each SERCOS-interface SERV**OSTAR**®-supported IDN is described and listed in numerical order. Each IDN description is displayed in the following format:

IDN # IDN Name

Description:
Data Length: **Units:**
Data Type: **Non-Volatile:**
Minimum: **Write Access:**
Maximum: **Serial Equivalent:**
Default: **Availability:**
NOTE: All fields are not applicable to every IDN description.

IDN 2: Communication Cycle Time

Description: The period at which MST, AT, and MDT telegrams are transmitted. The communication cycle time (CCT) may be incremented in 1 mS steps. The micro-interpolator (µI), IDN P110, must be disabled for CCTs greater than 6 mS.

Data Length: 2 bytes **Units:** uS
Data Type: Unsigned integer **Non-Volatile:** No
Minimum: 2,000 **Write Access:** CP 2
Maximum: 25,000 **Serial Equivalent:**
Default: None - master must download. **Availability:**

IDN 3: Shortest AT Transmission Starting Time

Description: The time required by the drive between the end of the MST and the start of the drive's AT.

Data Length: 2 bytes **Units:** µS
Data Type: Unsigned integer **Non-Volatile:** Yes
Minimum: **Write Access:** Read-only
Maximum: **Serial Equivalent:**
Default:85 **Availability:**

IDN 4: Transmit/Receive Transition Time

Description: The time required by the drive between the end of the MST and the start of the drive's AT.

Data Length: 2 bytes **Units:** µS
Data Type: Unsigned integer **Non-Volatile:** Yes
Minimum: **Write Access:** Read-only
Maximum: **Serial Equivalent:**
Default: 10 **Availability:**

IDN 5: Minimum Feedback Processing Time

Description: The time required by the drive for acquiring and processing cyclic feedback. This time period is measured from the feedback processing point to the end of the next MST.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: 316 µS
Units: µS
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 6: AT Transmission Starting Time

Description: The time at which the drive should transmit its AT during CP3 and CP4.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: IDN 3
Maximum: IDN 2
Default: None - the master must download
Units: µS
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 9: Position of Data Record in MDT

Description: The offset (in bytes) of the drive's data record within the MDT. The offset is measured from the MDT's address field.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 65,531
Default: None - the master must download
Units: Bytes
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 10: MDT Length

Description: The length of the MDT's data field, expressed in bytes. This length does not include the MDT delimiters, address field, or CRC.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 4
Maximum: 65,534
Default: None - the master must download
Units: Bytes
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 11: Class 1 Diagnostic (C1D)

Description: Lists the current fault status of the drive. When a fault occurs, the drive decelerates to a stop and releases torque. The C1D status bit (AT bit 13) is set and the corresponding fault bits are set within IDN 11. All faults are latched within IDN 11 and are reset through the "Reset Class 1 Diagnostic (C1D)" procedure (IDN 99).

Bit	Description
LSB 0	Overload fault (IDN 114)
1	Amplifier over temperature fault
2	Motor over temperature fault
3	Reserved: Cooling system fault (set to 0)
4	Control voltage fault (analog supply failure)
5	Feedback loss fault (IDN P67)
6	Commutation fault
7	Over current fault
8	Over voltage fault
9	Under voltage fault
10	Reserved: Power supply phase fault (set to 0)
11	Excessive position deviation (IDN 159)
12	Communication interface fault (IDN 14)
13	Software limit switch fault (IDN 49, 50, 55)
14	Reserved (set to 0)
MSB 15	Manufacturer-defined fault (IDN 129)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 12: Class 2 Diagnostic (C2D)

Description: Lists warnings that may indicate an impending shutdown. When an unmasked warning condition occurs, the corresponding warning bits are changed within IDN 12 and the C2D change bit (AT status word, bit 12) is set. The warning bits within IDN 12 are not latched and automatically reset when the warning condition is no longer valid. The C2D change bit is reset when IDN 12 is read through the service channel. IDN 97 may be used to mask warnings and their affect on the C2D change bit.

Bit	Description
LSB 0	Overload warning (IDN 310)
1	Reserved: Amplifier over temperature warning
2	Motor over temperature warning (IDN 312)
3	Reserved: Cooling system warning (set to 0)
4	Reserved (set to 0)
5	Reserved (set to 0)
6	Reserved (set to 0)
7	Reserved (set to 0)
8	Reserved (set to 0)
9	Reserved (set to 0)
10	Reserved (set to 0)
11	Reserved (set to 0)
12	Reserved (set to 0)
13	Reserved (set to 0)
14	Reserved (set to 0)
MSB 15	Manufacturer-defined warning flags (IDN 181)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 13:Class 3 Diagnostic (C3D)

Description: IDN 13 contains status flags. When an unmasked status condition changes, the corresponding status bit changes within IDN 13 and the C3D change bit (AT status word, bit 11) is set. The status bits within IDN 13 are not latched and automatically reset when the status condition is no longer valid. The C3D change bit is reset when IDN 13 is read through the service channel. IDN 98 may be used to mask particular status conditions and their affect on the C3D change bit.

Bit	Description
LSB 0	Reserved: Nfdbk = Ncmd
1	Reserved: Nfdbk = 0
2	Reserved: | Nfdbk | < | N threshold |
3	Reserved: | Torque | =| Torque threshold |
4	Reserved: | Torque | =| Torque limit |
5	Reserved: | Ncmd | > | N limit |
6	In Position (IDN 57)
7	Reserved: | Power | =| Power threshold |
8	Reserved
9	Reserved: | Nfdbk | =Min spindle speed
10	Reserved: | Nfdbk | =Max spindle speed
11	Reserved
12	Reserved
13	Reserved
14	Reserved
MSB 15	Manufacturer-defined status flags (IDN 182)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:

Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 14: Interface Status

Description: IDN 14 contains the current communication phase (CP) and communication fault flags. In the event of a communication fault the drive not only decelerates to a stop and releases torque, but the drive's CP is returned to 0. The cause of the communication fault is latched in IDN 14 along with the CP in which the fault occurred. The master may retrieve this information from the drive by reading IDN 14 before issuing the fault reset procedure (IDN 99). C1D (IDN 11) bit 12 is a summary fault bit for IDN 14.

Bit	Description
0	CP
1	CP
2	CP
3	MST failure
4	MDT failure
5	Invalid phase (CP > 4)
6	Error during phase advance
7	Error during phase regression
8	Phase switch without proper acknowledgment
9	Switching to an uninitialized operation mode
10	Reserved: Duplicate drive addresses
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 15: Telegram Type Parameter

Description: The master uses IDN 15 to select the contents of the AT and MDT cyclic data fields. Selecting a pre-defined or standard telegram type completely defines the contents and order of cyclic data within the AT and MDT. All standard telegram types are supported except telegram type 1. Telegram type 7 or the application type telegram allows the master to define the contents and order of the AT and MDT cyclic data.

The IDNs that may be transferred as cyclic data within the AT and MDT are listed in IDN 187 and IDN 188 respectively. The maximum amount of AT and MDT cyclic data that the drive can transfer is specified in IDN185 and IDN186 respectively.

When the application telegram is selected, the master writes the desired cyclic data IDNs for the AT into IDN 16 and for the MDT into IDN 24.

IDN 15 Value	Telegram Type	Telegram Cyclic Data	
		MDT (Commands)	AT (Feedback)
0	Standard telegram 0	None	None
1	Standard telegram 1	Torque (IDN 80)	None
2	Standard telegram 2	Velocity (IDN 36)	Velocity (IDN 40)
3	Standard telegram 3	Velocity (IDN 36)	Motor Position (IDN 51)
11			External Position (IDN 53)
4	Standard telegram 4	Position (IDN 47)	Motor Position (IDN 51)
12			External Position (IDN 53)
5	Standard telegram 5	Pos/Vel (IDN 47/36)	Motor Pos/Vel (IDN 51/40)
13			External Pos/Vel (IDN 53/40)
6	Standard telegram 6	Velocity (IDN 36)	None
7	Application telegram	Contents defined within IDN 24	Contents defined within IDN 16

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 16: Configuration List of AT Cyclic Data

Description: An IDN list of the AT's cyclic data. The master fills this list with IDNs selected from a list of configurable AT data (IDN 187) when an application telegram has been selected through IDN 15. If a standard telegram has been selected through IDN 15, the drive fills this list with the corresponding AT cyclic data IDNs.

Data Length: 2 byte elements.
Variable length array.
Data Type: IDN
Minimum:
Maximum:
Default: Empty list.
Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 17: IDN List of All Operation Data

Description: An IDN list of all IDNs that are supported by the drive.
Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: Yes
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default:
Availability:

IDN 18: IDN List of All Operation Data for CP2

Description: An IDN list of all data that must be written by the master during CP2. The drive's CP2 to CP3 transition procedure (IDN 127) will fail if this data is not supplied by the master.
Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: Yes
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default:
Availability:

IDN 19: IDN List of All Operation Data for CP3

Description: An IDN list of all data that must be written by the master during CP3. The drive's CP3 to CP4 transition procedure (IDN 128) will fail if this data is not supplied by the master. The contents of this list will vary depending upon whether the drive has already been configured with motor data.
Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: No
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default:
Availability:

IDN 21: IDN List of Invalid Operation Data for CP2

Description: A list of all IDNs that the CP2 to CP3 transition procedure (IDN 127) considers invalid.
Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: No
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default: Empty list.
Availability:

IDN 22: IDN List of Invalid Operation Data for CP3

Description: A list of all IDNs that the CP3 to CP4 transition procedure (IDN 128) considers invalid.
Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: No
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default: Empty list.
Availability:

IDN 24: Configuration List of MDT Cyclic Data

Description: An IDN list of the MDT's cyclic data. The master fills this list with IDNs selected from a list of configurable MDT data (IDN 188) when an application telegram has been selected through IDN 15. If a standard telegram has been selected through IDN 15, the drive fills this list with the corresponding MDT cyclic data IDNs.

Data Length: 2 byte elements.
Variable length array.
Units: Empty list.

Data Type: IDN
Minimum:
Maximum:
Default:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 25: IDN List of All Procedure Commands

Description: An IDN list of all procedure IDNs that are supported by the drive.

Data Length: 2 byte elements.
Variable length array.
Units:

Data Type: IDN
Minimum:
Maximum:
Default:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 30: Manufacturer Version

Description: The master may retrieve a text string of the firmware version.

Data Length: 1 byte elements.
Variable length array.
Units:

Data Type: Text
Minimum:
Maximum:
Default:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: VER
Availability:

IDN 32: Primary Operation Mode

Description: Defines the drive's operational mode when the AT status word bits 8 and 9 are both 0. The master requests a particular operation mode by setting the MDT control word bits 8 and 9. The following table may be used to define the primary operation mode.

All reserved bits are not supported and must be zero. When the drive powers-up the operational mode is undefined and the master must define a primary operational mode in CP2.

Bit	Value	Description
0	000	No mode of operation
1	000	No mode of operation
2	000 001 010 011 100 101	No mode of operation Reserved: Torque control Velocity control Position control using motor feedback Reserved: Position control using external feedback Position control using motor and external feedback (dual loop)
3	0 1	Position control with follow error (IDN 159) Position control without following error
4	0	Reserved
5	0	Reserved
6	0	Reserved
7	0	Reserved
8	0	Reserved
9	0	Reserved
10	0	Reserved
11	0	Reserved
12	0	Reserved
13	0	Reserved
14	0 1	Command values are issued as cyclic data Reserved: Command values are issued through the service channel
15	0 1	Bits 0-14 are as defined above Reserved: Bits 0-14 are defined by the manufacturer

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0

Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent: OpMode
Availability:

IDN 36: Velocity Command Value

Description: The master issues the velocity command to the drive through IDN 36. IDN 36 may be used as MDT cyclic data. The velocity units depend upon the control unit cycle time (CUCT) which is presently equal to the CCT.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts/CUCT * 256
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent: JOG
Availability:

IDN 37: Additive Velocity Command Value

Description: An additional velocity offset that is added to the velocity command (IDN 36). IDN 37 may be used as MDT cyclic data. The velocity units depend upon the CUCT, IDN 1 which is presently equal to the CCT (IDN 2).

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default: 0
Units: Counts/CUCT * 256
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 40: Velocity Feedback Value

Description: The master retrieves the velocity feedback from the drive through IDN 40. IDN 40 may be used as AT cyclic data. The velocity units depend upon the CUCT which is presently equal to the CCT.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts/CUCT * 256
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: V
Availability:

IDN 41: Homing Velocity

Description: Defines the drive's velocity during the drive controlled homing procedure (IDN 148). The actual homing velocity may be limited by the bipolar velocity limit value (IDN 91).

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default: 100
Units: RPM
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: HOMESPD
Availability:

IDN 42: Homing Acceleration

Description: Defines the drive's maximum acceleration and deceleration during the drive controlled homing procedure (IDN 148). The homing acceleration may not be disabled through IDN P88.

Data Length: 4 bytes.
Data Type: Unsigned Integer
Minimum: 10
Maximum: 400,000
Default: 10,000
Units: RPM/s
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 44: Velocity Data Scaling Type

Description: Defines the scaling options for all velocity data. The velocity units depend upon the CUCT which is presently equal to the CCT. Only the "no scaling" option is supported.

Data Length: 2 bytes.
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 47: Position Command Value

Description: The master issues position commands to the drive through IDN 47. IDN 47 may be used as MDT cyclic data.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 49: Positive Position Limit Value

Description: The maximum position in the positive direction. The drive generates a position limit fault (IDN11, bit 13) when the drive reaches this limit and the software limit switches have been enabled through the position polarity parameter (IDN 55, bit 4).

Data Length: 4 bytes
Data Type: Integer
Minimum: -2,000,000,000
Maximum: 2,000,000,000
Default: 2,000,000,000
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: PMAX
Availability:

IDN 50: Negative Position Limit Value

Description: The maximum position in the negative direction. The drive generates a position limit fault (IDN11, bit 13) when the drive reaches this limit and the software limit switches have been enabled through the position polarity parameter (IDN 55, bit 4).

Data Length: 4 bytes.
Data Type: Integer
Minimum: -2,000,000,000
Maximum: 2,000,000,000
Default: -2,000,000,000
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: PMIN
Availability:

IDN 51: Position Feedback Value 1 (Motor Feedback)

Description: The master retrieves the motor's position feedback from the drive through IDN 51. IDN 51 may be used as AT cyclic data.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: PFB
Availability:

IDN 52: Reference Distance 1

Description: The distance from the machine zero point to the home position referenced through the motor feedback.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default: 0
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 53: Position Feedback Value 2 (External Feedback)

Description: The master retrieves the external position feedback from the drive through IDN 53. IDN 53 may be used as AT cyclic data.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: PEXT
Availability:

IDN 55: Position Polarity Parameter

Description: The polarity of position command and feedback data may be switched through IDN 55. In addition, IDN 55 enables the use of software limit switches. Software limit switches may only be enabled after homing. Only bit 4 is supported and all other bits must be set to zero.

Bit	Description	Setting
LSB 0	Position command polarity:	0 = Not inverted 1 = Inverted
1	Reserved - Additive position command polarity:	0 = Not inverted 1 = Inverted
2	Motor feedback polarity:	0 = Not inverted 1 = Inverted
3	Reserved - External position feedback polarity:	0 = Not inverted 1 = Inverted
4	Position Limit values: Refer to IDN 49 and 50	0 = Disabled 1 = Enabled
5	Reserved – Underflow / overflow threshold: Refer to IDN 280 and 281	0 = Disabled 1 = Enabled
6	Reserved	Set to 0
7	Reserved	Set to 0
8	Reserved	Set to 0
9	Reserved	Set to 0
10	Reserved	Set to 0
11	Reserved	Set to 0
12	Reserved	Set to 0
13	Reserved	Set to 0
14	Reserved	Set to 0
15	Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 1
Units:
Non-Volatile: Yes
Write Access: CP 2-4.
Serial Equivalent: DIR or (PLIM & 0x01) << 4
Availability:

IDN 57: Position Window

Description: Specifies a position error threshold between the accumulated position command and the position feedback. The drive is considered "in position" if the position error is below this threshold. C3D status bit 6 (IDN 13 and IDN 336) is set when the drive is within the position window defined by IDN 57.

Data Length: 4 bytes.
Data Type: Integer
Minimum: 0
Maximum: 32,767
Default: 100
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: PEINPOS
Availability:

IDN 76: Position Data Scaling Type

Description: Defines the scaling options for all position data. Only the "no scaling" option is supported with all data referenced to the motor shaft in absolute format.

Data Length: 2 bytes.
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 81: Additive Torque Command

Description: An additional torque offset that is added to the torque command (IDN 80). IDN 81 may be used as MDT cyclic data.

Data Length: 2 bytes
Data Type: Integer
Minimum:
Maximum:
Default: 0
Units: 0.1 % of motor I_C (IDN 111)
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 84: Torque Feedback Value

Description: The master retrieves the motor's torque feedback from the drive through IDN 84. IDN 84 may be assigned as AT cyclic data.

Data Length: 2 bytes
Data Type: Integer
Minimum:
Maximum:
Default:
Units: 0.1% of motor current (IDN 111)
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: I * DIPeak/MICont
Availability:

IDN 88: Receive to Receive Recovery Time

Description: The time required by the drive between the end of the MDT and the beginning of the MST.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: 739
Units: µS
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 89: MDT Transmission Starting Time

Description: The time at which the master should transmit the MDT during CP3 and CP4.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: IDN 3
Maximum: IDN 2
Default: None - the master must download
Units: µS
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 90: Command Value Processing Time

Description: The time required by the drive from the end of the MDT to the point at which the received command values are used.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: 405
Units: µS
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 91: Bipolar Velocity Limit

Description: Limits the motor's peak velocity, in both the clockwise (CW) and counter-clockwise (CCW) directions, by setting a limit on the velocity loop command.

Data Length: 4 bytes.
Data Type: Unsigned Integer
Minimum: 10
Maximum: Dependent upon motor speed (IDN 113), bus voltage (IDN 380), motor back EMF (IDN P26), and feedback resolution (IDN 116)
Default: Dependent upon motor speed (IDN 113), bus voltage (IDN 380), motor back EMF (IDN P26), and feedback resolution (IDN 116)
Units: RPM
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: Element 7: VLim Element 6: VMax
Availability:

IDN 92: Bipolar Torque Limit

Description: Defines the maximum torque limit in both the CW and CCW direction. When a configurable input mode (IDNP123, P125, or P127) is 8 and the corresponding configurable input (IDN P124, P126, or P128) is set, then bipolar torque limit 2 (IDN P84) defines the maximum torque limit in both directions.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Minimum of IDN 109 and IDN 110
Default: Minimum of IDN 109 and IDN 110
Units: 0.1 % of motor I_C (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: ILIM * DIPEAK/MICONT
Availability:

IDN 95: Diagnostic Message

Description: The master may read a text message from IDN 95 describing a latched fault.

Data Length: 1 byte elements. Variable length array.
Data Type: Text
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 96: Slave Arrangement

Description: The drive's SERCOS interface address is contained in both the upper and lower bytes of this IDN. The drive's address may range from 0 to 31 and is selected through DIP switches 5-1. A drive with an address of 0 is a repeater on the SERCOS ring. The drive does not participate in the CP run-up but re-transmits all received data.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: Hardware defined.
Units:
Non-Volatile:
Write Access: Read-only
Serial Equivalent: (ADDR << 8) | ADDR
Availability:

IDN 97: Class 2 Diagnostic Mask

Description: When a warning condition occurs, the corresponding warning bits are set within IDN 12 and the C2D change bit (AT status word, bit 12) is set. The warning bits within IDN 12 are not latched and automatically reset when the warning condition is no longer valid. The C2D change bit is reset when IDN 12 is read through the service channel. IDN 97 may be used to mask warnings and their affect on the C2D change bit. A masked warning does not affect the contents of IDN 12, but the C2D change bit will not be affected when the masked warning changes state. When a bit in IDN 97 is clear, then the corresponding bit in IDN 12 is masked.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0xFFFF
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 98: Class 3 Diagnostic Mask

Description: IDN 13 contains status flags. When a status condition becomes true, the corresponding status bit is set within IDN 13 and the C3D change bit (AT status word, bit 11) is set. The status bits within IDN 13 are not latched and automatically reset when the status condition is no longer valid. The C3D change bit is reset when IDN 13 is read through the service channel. IDN 98 may be used to mask particular status conditions and their affect on the C3D change bit. A masked status does not affect the contents of IDN 13, but the C3D change bit will not be affected when the masked status changes state. When a bit in IDN 98 is clear, then the corresponding bit in IDN 13 is masked.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0xFFFF
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 99 Procedure: Reset Class 1 Diagnostic

Description: Attempts to clear the latched faults contained in IDNs 11, 14, and 129. The reset will only clear faults that are no longer active. If all the faults are reset, the C1D status bit (AT bit 13) will reset. The fault reset procedure will fail if faults have been latched and the master has not reset the drive enable control bits (MDT bits 13-15).

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 100: Velocity Loop Proportional Gain

Description: Defines the velocity loop proportional gain for the proportional-integral velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). Larger gain values may be obtained through the velocity loop expanded proportional gain (IDN P104).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 65,535
Default: 500
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GV (lower 16 bits)
Availability:

IDN 104: Position Loop Proportional Gain

Description: Defines the proportional gain for the PID position loop controller.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0.01
Maximum: 70.00
Default: Calculated
Units: 0.01 (m/min)/mm α
0.01 (in/min)/mil α
0.01 (kRPM/min)/rev
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GP
Availability:

IDN 109: Motor Peak Current

Description: Defines the motor's peak rated current. When this IDN is modified, the drive enters an uncompensated state.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 1,000
Maximum: 350,000
Default: Motor Data
Units: milliamps RMS
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MIPEAK * 100
Availability:

IDN 110: Amplifier Peak Current

Description: Defines the drive amplifier's peak rated current. This hardware defined variable is set equal to twice the continuous rated current of the drive.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: Hardware defined.
Units: milliamps RMS
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: DIPEAK * 100
Availability:

IDN 111: Motor Continuous Stall Current

Description: Defines the motor's continuous rated current and the 100% torque reference value. When this IDN is modified, the drive enters an uncompensated state.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 1,000
Maximum: 175,000
Default: Motor Data
Units: milliamps RMS
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MICONT * 100
Availability:

IDN 112: Amplifier Rated Current

Description: Defines the drive amplifier's continuous current rating. This hardware defined variable is automatically determined by the drive.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: Hardware defined.
Units: milliamps RMS
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: DICONT * 100
Availability:

IDN 113: Maximum Motor Speed

Description: Defines the motor's maximum recommended speed. When IDN 113 is modified, the drive enters an uncompensated state.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 100,000
Maximum: 327,670,000
Default: Motor Data
Units: RPM
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MSPEED * 10,000
Availability:

IDN 114: System Load Limit

Description: Defines the system continuous current. When the system continuous current has been exceeded for too long, the drive enters fold back. The action taken by the drive upon entering fold back depends upon the fold back mode (IDN P72). IDN 114 is reset to its default value when the motor continuous current (IDN 111) or drive continuous current (IDN 112) is modified.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Minimum of IDN 111 and 112
Default: Minimum of IDN 109, 110, 111, and 112

Units: 0.1% of motor IC (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: ICONT * DIPEAK/MICONT
Availability:

IDN 115: External (Load) Position Feedback Type

Description: The master defines the characteristics of the external feedback with IDN 115. Only bit 3 is supported and all reserved bits must be set to zero.

Bit	Description	Setting
LSB 0	Reserved - Feedback type:	0 = Rotational 1 = Linear
1	Reserved: Distance coded reference marks:	0 = None 1 = Present
2	Reserved: Feedback resolution:	0 = Metric 1 = Inches
3	Direction polarity:	0 = Non inverted 1 = Inverted
4	Reserved: Reference marker pulse quantity:	0 = 1 marker 1 = Multiple cyclic markers
5	Reserved: Distance coded feedback count in positive direction:	0 = Positive 1 = Negative
6	Reserved: Measuring system type:	0 = Incremental 1 = Absolute
7	Reserved: Absolute measuring system usage:	0 = Absolute 1 = Incremental
8	Reserved	Set to 0
9	Reserved	Set to 0
10	Reserved	Set to 0
11	Reserved	Set to 0
12	Reserved	Set to 0
13	Reserved	Set to 0
14	Reserved	Set to 0
15	Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0

Units:
Non-Volatile: Yes
Write Access: CP 2 - 3.
Serial Equivalent: Bit 3 = XENCDIR
Availability:

IDN 116: Motor Feedback Resolution

Description: Defines the motor's rotary or linear feedback resolution. When this IDN is modified on encoder based systems, the drive enters an uncompensated state. IDN 116 cannot be modified on resolver-based systems.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 400 – Regular encoder
4 - Sine encoder feedback
Maximum: 40,000,000
2^RDRES
Default: Motor Data (encoder systems)
65536 (resolver systems)
Units: Counts/Rev
Non-Volatile: Yes
Write Access: Encoder: CP 2-4,
Resolver: Read-only
Serial Equivalent: MENCRES * 4 or
Availability:

IDN 117: External Feedback Resolution

Description: Defines the load's rotary or linear feedback resolution. IDN 115, bit 0 defines whether the external feedback type is rotary or linear.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 400
Maximum: 40,000,000
Default: 4096
Units: Counts/Rev
Non-Volatile: Yes
Write Access: CP 2-3
Serial Equivalent: XENCRES * 4
Availability:

IDN 124: Standstill Window

Description: The standstill window defines a velocity below which the motor is not considered moving. This velocity threshold is used to set the C3D status bit "velocity feedback = 0" (IDN 13, bit 1). The "velocity feedback = 0" status bit is duplicated in IDN 331 for use as a RTS.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 32,767
Default: 32,767
Units: RPM
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent:
Availability:

IDN 127: Procedure: Communication Phase 3 Transition Check

Description: Ensures that the drive is ready to switch from CP2 to CP3. The master must successfully execute this procedure prior to switching the CP from 2 to 3. If the procedure fails, IDN 21 contains a list of IDNs that the drive considers invalid.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN 128: Procedure: Communication Phase 4 Transition Check

Description: Ensures that the drive is ready to switch from CP3 to CP4. The master must successfully execute this procedure prior to switching the CP from 3 to 4. If the procedure fails, IDN 22 contains a list of IDNs the drive considers invalid.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 3
Serial Equivalent:
Availability:

IDN 129: Manufacturer Class 1 Diagnostic (MC1D)

Description: Lists the status of the latched manufacturer-defined drive faults. When a manufacturer-defined fault occurs, the drive decelerates to a stop and releases torque. The C1D status bit (AT bit 13) is set, IDN 11 bit 15 is set, and the corresponding manufacturer-defined fault bit is set within IDN 129. All manufacturer-defined faults are latched within IDN 129 and are reset through the "Reset Class 1 Diagnostic" procedure (IDN 99).

Bit	Description
LSB 0	Non-volatile data memory fault
1	Non-volatile data memory checksum fault
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Invalid drive/motor configuration. This fault may occur under the following circumstances: A) Invalid drive/motor compensation parameters B) Invalid control loops (IDN 181, bit 4) C) An encoder has not been initialized (IDN 181, bit 5)
9	Motor over speed fault (IDN P85)
10	Reserved
11	Reserved
12	Control unit synchronization bit did not toggle (IDN P152)
13	Control unit synchronization bit changed prematurely (IDN P152)
14	External communication fault
MSB 15	Internal firmware fault. Contact factory

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: STATUS
Availability:

IDN 130: Probe 1 Positive Edge Value

Description: The probing procedure (IDN 170) is used to capture the motor (or load) position when a digital input changes. IDN 130 contains the captured position when the probing procedure is configured, through the probe control parameter (IDN 169, bit 0), to capture the position on the rising edge of the digital input. IDN 130 may be configured as AT cyclic data.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 131: Probe 1 Negative Edge Value

Description: The probing procedure (IDN 170) is used to capture the motor (or load) position when a digital input changes. IDN 131 contains the captured position when the probing procedure is configured, through the probe control parameter (IDN 169, bit 1), to capture the position on the falling edge of the digital input. IDN 131 may be configured as AT cyclic data.

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 134: Master Control Word

Description: The MDT telegram's control word is stored as IDN 134 as a diagnostic aid. IDN 134 is only updated in CP 4.

Data Length: 2 bytes.
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 136: Positive Acceleration Limit Value

Description: Defines the drive's maximum positive acceleration when the acceleration/deceleration limit enable (IDN P88) is set.

Data Length: 4 bytes.
Data Type: Integer
Minimum: 10
Maximum: 400,000
Default: 400,000
Units: RPM/s
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: ACC
Availability:

IDN 137: Negative Acceleration Limit Value

Description: Defines the drive's maximum deceleration (negative acceleration) when the acceleration/deceleration limit enable (IDN P88) is set. The drive alternately uses the quick deceleration limit (IDN P87) under the following conditions: position limits are encountered, a fault has occurred, or the master has requested an active disable.

The quick deceleration limit (IDN P87) is always used by the drive when those conditions occur and is independent of the deceleration limit enable (IDN P88).

Presently, the drive does not support MDT control bit 13 (halt/restart), so clearing MDT control bit 13 causes an active disable at the quick deceleration rate followed by a torque release.

Data Length: 4 bytes.
Data Type: Integer
Minimum: -400000
Maximum: -10
Default: -400,000
Units: RPM/s
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: DEC
Availability:

IDN 141: Motor Type

Description: The motor type IDN contains the name of the motor connected to the drive.

Data Length: 1 byte elements.
Variable length array.
Data Type: Text
Minimum:
Maximum:
Default: Motor Data
Units:
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: Motor
Availability:

IDN 147: Homing Parameter

Description: The drive controlled homing procedure (IDN 148) is configured through IDN 41, IDN 42, IDN 52, IDN 147, and IDN 150. Only bits 0-2, and 5-7 are supported and all other bits must be set to zero.

Bit	Description	Setting
LSB 0	Homing direction:	0 = CW 1 = CCW
1	Home switch polarity:	0 = Active on rising edge 1 = Active on falling edge
2	Home switch location:	0 = Master 1 = Drive
3	Reserved - feedback source:	0 = Motor 1 = External
4	Reserved - Home enable evaluation:	Set to 0
5	Home switch evaluation:	0 = Evaluate 1 = Not evaluated
6	Marker pulse evaluation:	0 = Evaluate 1 = Not evaluated
7	Stop criteria:	0 = After position capture 1 = On home position
8	Reserved	Set to 0
9	Reserved	Set to 0
10	Reserved	Set to 0
11	Reserved	Set to 0
12	Reserved	Set to 0
13	Reserved	Set to 0
14	Reserved	Set to 0
15	Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:

Default: 4

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN.
Serial Equivalent: [IDN 147] = [IDN 147] | (HOMETYPE << 5)
Availability:

IDN 148: Procedure: Drive Controlled Homing

Description: The drive automatically enters an internal position mode and homes the drive. Homing is configured through the homing velocity (IDN 41), homing acceleration (IDN 42), reference distance 1 (IDN 52), homing parameter (IDN 147), and the reference offset (IDN 150). The homing acceleration may not be disabled through IDN P88.

The homing procedure fails under the following conditions:

1. The probing procedure (IDN 170) is active.
2. The home switch is located on the drive (IDN 147, bit 2 is set) and is evaluated during homing (IDN 147, bit 5 is clear) and a configurable input has not been configured as a home switch input. Configurable inputs are configured through IDNs P123, P125, and P127.
3. The home switch is located on the master (IDN 147, bit 2 is clear) and will be evaluated during homing (IDN 147, bit 5 is clear) and the home enable signal (IDN 407) has not been configured as a RTC.
4. A fault occurs during drive controlled homing.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 150: Motor Reference Offset

Description: Used during the homing to determine the motor's position feedback relative to the machine zero point. The motor reference offset is the distance from the home marker to the home position. The motor position (IDN 51) relative to the machine zero point at the homing marker is equal to the reference distance 1 (IDN 52) minus the motor reference offset (IDN 150).

Data Length: 4 bytes.
Data Type: Integer
Minimum:
Maximum:
Default: 0
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent:
Availability:

IDN 155: Friction Torque Compensation

Description: An additive torque value that is used when accelerating from a standstill in order to compensate for the affects of coulomb friction.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Depends upon IDNs 110 (IDN 111)
Default: 0
Units: 0.1 % of motor continuous current
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IFRIC * DIPEAK/MICONT and 111.
Availability:

IDN 159: Monitoring Window

Description: The monitoring window defines the maximum position error. When the absolute distance between the active position command and active position feedback exceeds the monitoring window, an "excessive position deviation" fault is generated (IDN 11, bit 11). Following error fault monitoring may be enabled or disabled through the operational mode (IDN 32, bit 3).

Data Length: 4 bytes.
Data Type: Unsigned Integer
Minimum:
Maximum:
Default: 2,147,483,647
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: PEMAX
Availability:

IDN 160: Acceleration Data Scaling Type

Description: Defines the scaling options for all acceleration data. Only the "no scaling" option is supported.

Data Length: 2 bytes.
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 163: Weight Counter Balance

Description: An additive torque value used when accelerating from a standstill to compensate for the effects of coulomb friction.

Data Length: 2 bytes
Data Type: Integer
Minimum: Depends upon IDNs 110 and 111.
Maximum: Depends upon IDNs 110 and 111.
Default: 0 **Availability:**
Units: 0.1 % of motor I_C (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IGRAV * DIPEAK/MICONT

IDN 169: Probe Control Parameter

Description: The probe control parameter defines the input signal edge that will result in a position capture during the probing procedure (IDN 170). Only probing level 1 is supported. Therefore, only bits 0 and 1 are supported and only one active edge may be selected.

Bit	Description	Setting
LSB 0	Probe 1 - Capture on positive edge:	0 = Inactive 1 = Active
1	Probe 1 - Capture on negative edge:	0 = Inactive 1 = Active
2	Reserved - Probe 2 - Capture on positive edge:	0 = Inactive 1 = Active
3	Reserved - Probe 2 - Capture on negative edge:	0 = Inactive 1 = Active
4	Reserved	Set to 0
5	Reserved	Set to 0
6	Reserved	Set to 0
7	Reserved	Set to 0
8	Reserved	Set to 0
9	Reserved	Set to 0
10	Reserved	Set to 0
11	Reserved	Set to 0
12	Reserved	Set to 0
13	Reserved	Set to 0
14	Reserved	Set to 0
15	Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum: 0
Maximum: 2
Default: 0

Units: No
Non-Volatile:
Write Access: CP 2-4, EN.
Serial Equivalent:
Availability:

IDN 170: Procedure: Probing

Description: Probing is used to capture the motor (or external) position when a digital input changes. Probing level 1 is supported. Therefore, only 1 probe input is supported that may trigger a position capture using only one edge (rising or falling, but not both) of the digital input signal. The probe control parameter (IDN 169) is used to configure the digital input edge that causes a position capture. Once the probe procedure is started by the master, it continues indefinitely until either the master cancels the probing procedure or an error occurs. The probing procedure fails under the following conditions:

The homing procedure (IDN 148) is active.
A flexible input has not been configured as a position capture input.
Flexible inputs are configured through IDNs P123, P125, and P127.

During the probing procedure, the master arms the probe trigger by setting the probe 1 enable signal (IDN 405). After the probe trigger has been armed, the next rising or falling edge (as specified in IDN 169) on the probe 1 input (IDN 401) latches the motor or external position and causes a probe latch status (IDN 179) bit to set. Any further changes in the probe 1 input are ignored until the master re-arms the probe trigger by clearing and setting the probe 1 enable signal. The master may read the captured position through either the probe 1 positive edge value (IDN 130) or the probe 1 negative edge value (IDN 131).

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 179: Probe Position Latch Status

Description: The probe status parameter indicates whether a position has been captured and latched within IDN 130 or 131. Each supported status bit may be assigned to a RTS bit using IDN 409 or 410.

Bit	Description	Setting
LSB 0	Probe 1 - Position latched on positive edge:	0 = No 1 = Latched
1	Probe 1 - Position latched on negative edge:	0 = No 1 = Latched
2	Reserved - Probe 2 - Position latched on positive edge:	0 = No 1 = Latched
3	Reserved - Probe 2 - Position latched on negative edge:	0 = No 1 = Latched
4	Reserved	Set to 0
5	Reserved	Set to 0
6	Reserved	Set to 0
7	Reserved	Set to 0
8	Reserved	Set to 0
9	Reserved	Set to 0
10	Reserved	Set to 0
11	Reserved	Set to 0
12	Reserved	Set to 0
13	Reserved	Set to 0
14	Reserved	Set to 0
15	Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum: 0
Maximum: 2
Default: 0

Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 181: Manufacturer Class 2 Diagnostic (MC2D)

Description: Lists the status of the manufacturer-defined drive warnings. When an unmasked manufacturer-defined warning condition changes, the C2D change bit (AT status word, bit 12) is set, the manufactured defined warning summary bit (IDN 12, bit 15) is set, and the corresponding warning bits within MC2D are changed appropriately.

The warning bits within the MC2D are not latched and are automatically reset when the warning condition is no longer valid. The manufactured defined warning summary bit (IDN 12 , bit 15) is cleared when IDN 181 is read through the service channel. The C2D change bit is reset when IDN 12 is read through the service channel. IDN P150 may be used to mask manufacturer-defined warnings and their affect on the C2D change bit and the manufacturer-defined warning summary bit.

Bit	Warning Description
LSB 0	Hardware CW limit switch (IDN P136)
1	Hardware CCW limit switch (IDN P137)
2	Hardware CW limit switch disabled (IDN P135) or not routed (IDN P123, P125, P127)
3	Hardware CCW limit switch disabled (IDN P135) or not routed (IDN P123, P125, P127)
4	Invalid controller warning
5	Encoder not initialized warning
6	Reserved
7	Reserved
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Reserved
13	PLL unlocked
14	AT telegram processing over-run
15	MDT telegram processing over-run

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: Bit 0 = CW, bit 1 = CCW
Availability:

IDN 182: Manufacturer Class 3 Diagnostic (MC3D)

Description: Lists the status of the manufacturer-defined drive statuses. When an unmasked manufacturer-defined status condition changes, the C3D change bit (AT status word, bit 11) is set, the manufactured defined status summary bit (IDN 13, bit 15) is set, and the corresponding status bits within MC3D are changed appropriately. The status bits within the MC3D are not latched and are automatically reset when the status condition is no longer valid. The manufactured defined status summary bit (IDN 13 , bit 15) is cleared when IDN 182 is read through the service channel. The C3D change bit is reset when IDN 13 is read through the service channel. IDN P151 may be used to mask manufacturer-defined statuses and their affect on the C3D change bit and the manufacturer-defined status summary bit.

Bit	Description
0	Hold Mode Active (IDN P153)
1	Reserved
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 185: Maximum Length of AT Configurable Data

Description: Defines the maximum length, in bytes, of the AT's cyclic data field. The master may use this IDN to determine how many IDNs may be placed within the application telegram (refer to IDN 15).

Data Length: 2 bytes.
Data Type: Unsigned Integer
Minimum:
Maximum:
Default: 8
Units: Bytes
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 186: Maximum Length of MDT Configurable Data

Description: Defines the maximum length, in bytes, of the MDT's cyclic data field. The master may use this IDN to determine how many IDNs may be placed within an application telegram (refer to IDN 15).

Data Length: 2 bytes
Data Type: Unsigned Integer
Minimum:
Maximum:
Default: 8

Units: Bytes
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 187: List of AT Configurable Data IDNs

Description: Lists all the IDNs that may be transferred as AT cyclic data. The master may use this IDN to determine the IDNs that may be placed within an application telegram (refer to IDN 15). The following IDNs may be assigned as AT cyclic data:

IDN	Description
36	Velocity command value
37	Additive velocity command
40	Velocity feedback value
47	Position command value
51	Position feedback value 1 (motor)
53	Position feedback value 2 (external)
81	Additive torque command value
84	Torque feedback value
130	Probe 1 positive edge value
131	Probe 1 negative edge value
P146	Inputs status
P161	Analog input value

Data Length: 2 byte elements.
Variable length array.
Data Type: IDN
Minimum:
Maximum:
Default:

Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 188: List of MDT Configurable Data IDNs

Description: Lists all the IDNs that may be transferred as MDT cyclic data. The master may use this IDN to determine the IDNs that may be placed within an application telegram (refer to IDN 15). The following IDNs may be assigned as MDT cyclic data:

IDN	Description
36	Velocity command value
37	Additive velocity command value
47	Position command value
81	Additive torque command value

Data Length: 2 byte elements.
Variable length array.
Units:
Data Type: IDN
Non-Volatile: Yes
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent:
Default:
Availability:

IDN 189: Following Distance

Description: Defines the position error as the position command value minus the motor (or external) feedback value.

Data Length: 4 bytes.
Units: Counts
Data Type: Integer
Non-Volatile: No
Minimum:
Write Access: Read-only
Maximum:
Serial Equivalent: PE
Default:
Availability:

IDN 191: Procedure: Cancel Reference Point

Description: The drive resets the "position feedback value status" (IDN 403). This procedure fails if the homing procedure (IDN 148) is active.

Data Length: 2 bytes
Units:
Data Type: Binary
Non-Volatile: No
Minimum:
Write Access: CP 2-4, EN
Maximum:
Serial Equivalent:
Default: 0
Availability:

IDN 192: IDN List of Back-up Operation Data

Description: Contains a list of IDNs that the master may use to create a back-up data set for the drive.

Data Length: Variable length array
of 2 byte elements.
Units:
Data Type: IDN
Non-Volatile: Yes
Minimum:
Write Access: Read-only.
Maximum:
Serial Equivalent: Dump
Default:
Availability:

IDN 207: Drive Off Delay Time

Description: Sets the amount of time that the drive remains enabled after the "drive off" control bit (MDT control word, bit 15) has been reset (active disable) and the motor speed is below the active disable threshold speed (IDN P16).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0.0 mS
Maximum: 6553.5 mS
Default: 10.0 mS
Units: 0.1 mS
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: DisTime
Availability:

IDN 263: Procedure: Load Working Memory

Description: Loads all data saved in non-volatile memory into "active" system memory.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4
Serial Equivalent: LOAD
Availability:

IDN 264: Procedure: Back-up Working Memory

Description: Stores all data necessary for operation into non-volatile memory. Previously saved operation data will be over written.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
N**on-Volatile:** No
Write Access: CP 2-4, EN
Serial Equivalent: SAVE
Availability:

IDN 296: Velocity Feed Forward Gain

Description: Defines a multiplier of the velocity command, which is generated by the position profile, that is added to the velocity loop command in order to reduce the velocity dependent following error.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2000
Default: 0
Units: 0.1%
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPVFR
Availability:

IDN 301: Realtime Control (RTC) Bit 1 Allocation

Description: Assigns a control signal IDN to RTC bit 1 (MDT control word bit 6). Two RTC bits are defined within the MDT control word (bits 6 and 7) and may be updated every communication cycle by the master. The following rules govern the assignment and use of a RTC bit (i.e., writing IDN 301 or 303):

1. Only certain control signal IDNs of type binary may be assigned to the RTC allocation IDNs. The exception is IDN 0, which indicates that the corresponding RTC bit is undefined.
2. RTC bits 1 and 2 are not allocated to the same IDN. The exception is IDN 0.
3. A service channel writes to an IDN allocated as a RTC bit generates a write-protect error (i.e., the RTC bit's IDN is write protected when the RTC bit assignment is made).
4. The master adheres to the following timing rules when allocating and de-allocating RTC bits. The rules depend upon whether the previous or next RTC bit assignment uses IDN 0.
   - Case: IDN 301/303 = 0 -> IDN 301/303 = RTC bit IDN (allocation)
   - The master must define the RTC bit within the MDT control word prior to writing IDN 301/303 element 7.
   - Case: IDN 301/303 = RTC bit IDN -> IDN 301/303 = 0 (de-allocation)
   - The previously assigned RTC bit remains valid in the MDT control word until the drive's service channel busy bit is reset.
   - Case: IDN 301/303 = RTC bit IDN -> IDN 301/303 = RTC bit IDN (re-allocation)
5. The state of the current RTC bit remains valid in the MDT control word until the master transmits the write request of the RTC allocation IDN element 7. When the drive sets the busy bit, the master begins to transmit the new RTC bit within the MDT.

WARNING: In the period between writing IDN 301/303 element 7 until the busy bit is reset, the master must ensure that RTC bit value transmitted within the MDT control word does not lead to invalid operation states. Generally, this is only possible when the RTC bit has not been assigned (i.e., IDN 301/303 = 0 before the RTC bit IDN assignment). The transition from an active RTC bit assignment to another RTC bit assignment is only safe when IDN 0 is assigned to the RTC bit as an intermediate step.

The drive adheres to the following timing rules when a RTC bit being allocated and de-allocated:

1. A new RTC bit assignment is evaluated by the drive prior to the service channel busy bit being reset (i.e., a write to IDN 301 or 303 defines the new IDN signal level from bits 7 or 6 of the MDT control word before the busy bit is reset).
2. The evaluation of the previous RTC bit within the drive ceases before the service channel busy bit is reset.

Data Length: 2 bytes
Data Type: IDN
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 303: Realtime Control (RTC) Bit 2 Allocation

Description: Assigns a control signal IDN to RTC bit 2 (MDT control word bit 7). Two RTC bits are defined within the MDT control word (bits 6 and 7) and are updated every communication cycle by the master. For further information refer to IDN 301.

Data Length: 2 bytes
Data Type: IDN
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 304: Realtime Status (RTS) Bit 1

Description: The value of the IDN assigned to RTS bit 1.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 305: Realtime Status (RTS) Bit 1 Allocation

Description: Assigns a status signal IDN to RTS bit 1 (AT status word bit 6). Two RTS bits are defined within the AT status word (bits 6 and 7) and updated by the drive during CP 4. The following rules govern the assignment and use of a RTS bit (i.e., writing IDN 305 or 307):

1. Only certain status signal IDNs of type binary are assigned to the RTS allocation IDNs. The exception is IDN 0, which indicates that the RTS bit is undefined.
2. The master no longer evaluates a previous RTS assignment after transmitting a write request for element 7 of a RTS bit allocation IDN.
3. The previously assigned RTS bit remains valid until the service channel busy bit is set.
4. The master does not start evaluating a new RTS bit assignment until the service channel busy bit is reset by the drive.

Data Length: 2 bytes
Data Type: IDN
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 306: Realtime Status (RTS) Bit 2

Description: The value of the IDN assigned to RTS bit 2.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 307: Realtime Status (RTS) Bit 2 Allocation

Description: Assigns a status signal IDN to RTS bit 2 (AT status word bit 7). Two RTS bits are defined within the AT status word (bits 6 and 7) and updated by the drive during CP 4. For further information refer to IDN 305.

Data Length: 2 bytes
Data Type: IDN
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, EN
Serial Equivalent:
Availability:

IDN 310: Overload Warning

Description: The over load warning bit becomes set when the system load level (IDN 114) has been exceeded for too long and the drive enters fold back. In fold back the drive current is gradually limited (in an exponential fashion) to the value defined in IDN 114. The amount of time that the drive may remain in fold back, without issuing a fault, is defined by the fold back mode (IDN P72) and the fold back warning time (IDN P73). IDN 310 duplicates the C2D over load warning bit
(IDN 12, bit 0) and is useful for assigning the over load warning signal to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: FOLD
Availability:

IDN 312: Motor Over Temperature Warning

Description: The motor over temperature warning bit becomes set when the motor thermostat opens indicating an over heated motor. The amount of time that may elapse, without issuing a fault, is defined by the motor over temperature mode (IDN P140). IDN 312 duplicates the C2D motor over temperature warning bit (IDN 12, bit 2) and is useful for assigning the motor over temperature warning signal to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: THERM
Availability:

IDN 331: Status: Velocity Feedback = 0

Description: A status signal IDN that is set when the velocity feedback (IDN 40) is within the standstill window (IDN 124). IDN 331 duplicates the C3D "Nfdbk = 0" status bit (IDN 13, bit 1) and may be assigned to a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 336: Status: In Position

Description: A status signal IDN that is set when the motor feedback is following the commanded position within the range set by the position window (IDN 57). IDN 336 duplicates the C3D "in position" status bit (IDN 13, bit 6) and may be assigned to a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: INPOS the "in position" status signal to a RTS bit.
Availability:

IDN 348: Acceleration Feed-Forward Gain

Description: Defines a multiplier of the acceleration command, which is generated by the position profile, that is added to the current loop command in order to reduce the acceleration dependent following error.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2000
Default: 0
Units: 0.1%
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPAFR
Availability:

IDN 380: DC BUS Voltage

Description: Defines the drive's DC bus voltage and compensates the current controller. When this IDN is modified, the drive enters a "no-compensation" state, requiring execution of the reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 10
Maximum: 850
Default: Drive Data
Units: Volts
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: VBUS
Availability:

IDN 400: Home Switch Status

Description: Contains the state of the home switch. The digital input used as home switch input is assigned through the use of IDNs P123, P125, or P127. IDN 400 is useful for assigning the home switch signal to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: IN1, IN2, or IN3
Availability:

IDN 401: Probe 1

Description: Contains the state of the probe 1 input. The digital input used as a probe is assigned through the use of IDN P123, P125, or P127. IDN 401 is useful for assigning the probe signal to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 403: Position Feedback Value Status

Description: When the drive switches the position feedback values to the coordinates referred to the machine zero point, the drive sets bit 0 of this IDN in order to inform the control unit that all actual position values are based on the zero point of the machine.

Bit 0 is reset when either the drive controlled homing procedure (IDN 148) or the "Cancel reference point" procedure (IDN 191) is started or when the drive loses its reference to the zero point of the machine. The Position feedback value status may be assigned to a RTS. Structure of position feedback value status:

Bit	Description
LSB 0	0 - Position feedback value not referenced to machine zero point 1 - Position feedback value referenced to machine zero point
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
8	Not used
9	Not used
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Not used

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability: SERCOS 1.7.6

IDN 405: Probe 1 Enable

Description: Used to arm the position capture mechanism so that the next valid probing signal edge captures the current position into IDN 130 or 131. Refer to IDN 170 for more information. The probe 1 enable signal may be assigned to a RTC.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability::

IDN 409: Probe 1 Positive Edge Latched Status

Description: Indicates whether captured position data has been latched within IDN 130 after the rising edge of the probe 1 input signal (IDN 401). Position data is only latched on the positive edge of probe 1 if the probing procedure (IDN 170) is active and the probe control parameter (IDN 169) has been configured to use the positive edge of probe 1. Additionally, probe 1 must be armed by setting the probe 1 enable (IDN 405). After arming probe 1, the next probe 1 rising edge captures the current position and the "probe 1 positive edge latched status" is set when the captured data is available in IDN 130. Once the latched status has been set, no more position captures occur on the rising edges of the probe 1 input until the master re-arms probe 1 by clearing and setting the probe 1 enable. Clearing the probe 1 enable signal resets the latch status.

IDN 409 duplicates information found in the probe status (IDN 179, bit 0) and is useful for assigning the "probe 1 positive edge latched status" to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN 410: Probe 1 Negative Edge Latched Status

Description: Indicates whether captured position data has been latched within IDN 131 after the falling edge of the probe 1 input signal (IDN 401). Position data is only latched on the negative edge of probe 1 if the probing procedure (IDN 170) is active and the probe control parameter (IDN 169) has been configured to use the negative edge of probe 1. Additionally, probe 1 must be armed by setting the probe 1 enable (IDN 405). After arming probe 1, the next probe 1 falling edge captures the current position and the "probe 1 negative edge latched status" is set when the captured data is available in IDN 131. Once the latched status has been set, no more position captures occur on the falling edges of the probe 1 input until the master re-arms probe 1 by clearing and setting the probe 1 enable. Clearing the probe 1 enable signal resets the latch status.

IDN 410 duplicates information found in the probe status (IDN 179, bit 1) and is useful for assigning the "probe 1 negative edge latched status" to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

IDN P15: (32, 783) Drive Disable Status

Description: Indicates drive conditions that prevent a drive from being enabled. A set bit indicates an active condition that may prevent the drive from being enabled.

Bit	Description
LSB 0	Remote Enable input
1	Master enable input (MDT enable bits)
2	DIP switch enable input (DIP switch 8)
3	Active faults (IDN 11)
4	Velocity loop design failure
5	Encoder not initialized.
6	Reserved (set to zero)
7	Reserved (set to zero)
8	Reserved (set to zero)
9	Reserved (set to zero)
10	Reserved (set to zero)
11	Reserved (set to zero)
12	Reserved (set to zero)
13	Reserved (set to zero)
14	Reserved (set to zero)
15	CP less than 4

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: Status word 1 (bits 0 - 5)
Availability:

IDN P16: (32, 784) Active Disable Threshold Speed

Description: When the motor speed drops below the active disable threshold speed during an active disable process, the drive off delay time (IDN 207) begins to count down. After the drive off delay time has expired, the drive is disabled.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 14,999
Default: 50
Units: RPM
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: DisSpeed
Availability:

IDN P17: (32, 785) Procedure: Clear Non-Volatile Memory

Description: When this procedure executes successfully the drive nulls it's non-volatile memory and enters a "no-compensation" state. The "no-compensation" state may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4
Serial Equivalent: CLREEPROM
Availability:

IDN P22: (32, 790) Number of Motor Poles

Description: The number of motor poles is used for commutation control and represents the number of individual magnetic poles of the motor (not pole pairs). When this IDN is modified, the drive will enter a "no-compensation" state, which may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 2
Maximum: 80
Default: Motor Data

Units: Poles
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MPOLES
Availability:

IDN P23: (32, 791) Rotor's Moment of Inertia

Description: The motor rotor inertia (IDN P23) in conjunction with the load to motor moment of inertia ratio (IDN P101) defines the system's moment of inertia. The load to motor moment of inertia ratio (IDN P101), the motor inertia (IDN P23), and the closed loop bandwidth (IDN P100) are used to define the standard pole placement (SPP) velocity controller.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 2,000,000,000
Default: Motor Data

Units: $K_g \bullet m^2 \bullet 10^{-6}$
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MJ
Availability:

IDN P24: (32, 792) Linear Motor Pole Pitch

Description: Defines the pole pitch for a linear motor. The pole pitch for a linear motor is the length of one electrical cycle (360 electrical degrees).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 500
Default: 16

Units: mm per 360 electrical degrees
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MPitch
Availability:

IDN P25: (32, 793) Minimum Motor Inductance

Description: The minimum line-to-line motor inductance is used to design the current loop controller and as an input to the torque angle control algorithms. When this IDN is modified, the drive enters a "no-compensation" state, which may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 32,767
Default: Motor Data

Units: milli-Henries * 10 -2
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MLMIN
Availability:

IDN P26: (32, 794) Motor Back EMF Constant

Description: The back EMF constant is used to design the current loop controller. When this IDN is modified, the drive enters a "no-compensation" state, which may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 3900
Default: Motor Data
Units: Volts (RMS) / kRPM
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MBEMF
Availability:

IDN P27: (32, 795) Motor Back EMF Compensation

Description: Defines the amount of back EMF compensation, as a percentage, that is applied to the motor command.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 100
Default: Motor Data
Units: Percent
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: MBEMFCOMP
Availability:

IDN P28: (32, 796) Current Loop Adaptive Gain at Peak Current

Description: Defines the current loop adaptive gain value at peak motor current (IDN 109). The current based adaptive gain algorithm increases current loop stability by reducing the current loop gain as the motor current increases. The current loop adaptive gain is configured by defining the gain values at peak motor current (IDN P28), continuous motor current (IDN P29), and zero motor current (typically 100%). All other gains between zero, continuous, and peak motor current are interpolated linearly. When this IDN is modified, the drive enters a "no-compensation" state, which may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1 to 10 percent
Maximum: 100 to 1000 percent
Default: 4 to 40 percent
Units: Percent * 10.
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MLGAINP
Availability:

IDN P29: (32, 797) Current Loop Adaptive Gain at Continuous Current

Description: Defines the current loop adaptive gain value at continuous motor current (IDN 111). The current based adaptive gain algorithm increases current loop stability by reducing the current loop gain as the motor current increases. The current loop adaptive gain is configured by defining the gain values at peak motor current (IDN P28), continuous motor current (IDN P29), and zero motor current (typically 100%).

All other gains between zero, continuous, and peak motor current are interpolated linearly. When this IDN is modified, the drive will enter a "no-compensation" state, which may be cleared through the fault reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1 to 10 percent
Maximum: 100 to 1000 percent
Default: 8 to 80 percent
Units: Percent * 10.
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MLGAINC
Availability:

IDN P30: (32, 798) Current Loop Adaptive Gain at Zero Current

Description: Defines the current loop adaptive gain value at zero motor current. The current based adaptive gain algorithm increases current loop stability by reducing the current loop gain as the motor current increases. The current loop adaptive gain is configured by defining the gain values at peak motor current (IDN P28), continuous motor current (IDN P29), and zero motor current (IDN P30, typically 100%). All other gains between zero, continuous, and peak motor current are interpolated linearly. When this IDN is modified, the drive enters a "no-compensation" state, which may be cleared through the fault reset procedure
(IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1to 10 percent
Maximum: 100 to 1000 percent
Default: 10 to 100 percent
Units: Percent * 10.
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MLGainZ
Availability:

IDN P31: (32, 799) Torque Angle Advance at Continuous Current

Description: Defines the torque related commutation angle advance at the motor's continuous current rating (IDN 111). Torque angle advance helps to increase reluctance torque.

For surface magnet motors the typical advance value is 5 electrical degrees. For motors with embedded magnets, the typical advance value ranges from 8 to 10 electrical degrees.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 45
Default: 10
Units: Electrical degrees.
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: MTANGLC
Availability:

IDN P32: (32, 800) Torque Angle Advance at Peak Current

Description: Defines the torque related commutation angle advance at the motor's peak current rating (IDN 109). Torque angle advance helps to increase reluctance torque. For surface magnet motors the typical advance value is 10 electrical degrees. For motors with embedded magnets, the typical advance value ranges from 23 to 25 electrical degrees.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 45
Default: 23
Units: Electrical degrees.
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: MTANGLP
Availability:

IDN P33: (32, 801) Velocity Angle Advance at Maximum Speed

Description: Defines the velocity related commutation angle advance at the motor's maximum speed (IDN 113). The velocity angle advance is configured by defining the angle advance at maximum motor speed (IDN P33) and half motor speed (IDN P34). The angle advance between full and half speed is linearly interpolated.

After non-volatile memory has been cleared, IDN P33 is set to 10. The drive's configuration algorithm bases the default velocity angle advance values on the maximum motor speed (IDN 113) and the number of motor poles (IDN P22). However, if the master changes any of the velocity angle advance values, the changed values are not modified during the drive's configuration process.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 90
Default: Calculated from motor data.
Units: Electrical degrees.
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: MVANGLF
Availability:

IDN P34: (32, 802) Velocity Angle Advance at Half Speed

Description: Defines the velocity related commutation angle advance at half the motor's maximum speed (IDN 113). The velocity angle advance is configured by defining the angle advance at maximum motor speed (IDN P33) and half motor speed (IDN P34). The angle advance between full and half speed is linearly interpolated.

After non-volatile memory has been cleared, IDN P34 is set to 5. The drive's configuration algorithm bases the default velocity angle advance values on the maximum motor speed (IDN 113) and the number of motor poles (IDN P22). However, if the master changes any of the velocity angle advance values, the changed values are not modified during the drive's configuration process.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 90
Default: Calculated from motor data.
Units: Electrical degrees.
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: MVANGLH
Availability:

IDN P35: (32, 803) Hall Sensor Inversion

Description: Allows the master to invert the polarity of the hall sensor feedback signals used by the drive. A hall channel is inverted if the corresponding bit in IDN P35 is set.

Bit	Description
LSB 0	Phase A inversion
1	Phase B inversion
2	Phase C inversion
3	Reserved (set to 0)
4	Reserved (set to 0)
5	Reserved (set to 0)
6	Reserved (set to 0)
7	Reserved (set to 0)
8	Reserved (set to 0)
9	Reserved (set to 0)
10	Reserved (set to 0)
11	Reserved (set to 0)
12	Reserved (set to 0)
13	Reserved (set to 0)
14	Reserved (set to 0)
15	Reserved (set to 0)

Data Length: 2 bytes
Data Type: Binary
Minimum: 0
Maximum: 7
Default: 0 (no channels inverted)
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MHINVX
Availability:

IDN P36: (32, 804) Motor Encoder Offset

Description: Specifies the distance from electrical zero to the index marker. The process of determining the encoder offset depends upon the motor's encoder type (IDN P37). If the system has hall sensors and a marker pulse, the "find index marker" procedure (IDN P62) is used to determine the motor encoder offset. If the system only has a marker pulse (no hall sensors), the "encoder initialization" procedure (IDN P60) is executed first to find an electrical zero and then the "find index marker" procedure (IDN P62) is used to determine the motor encoder offset.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Motor encoder resolution (IDN 116) - 1
Default: Motor data (120 degrees if undefined)
Units: Encoder counts
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MENCOff
Availability:

IDN P37: (32, 805) Motor Encoder Type

Description: Specifies whether an encoder based system includes a marker pulse and/or hall sensors and is used to determine the encoder initialization method.

Motor Encoder Definitions (IDN P37)			
Encoder Type	**Marker**	**Halls**	**Encoder Initialization Method**
0	Yes	Yes	IDN P62 Procedure
1	Yes	No	IDN P60 and IDN P62 Procedures
3	No	No	IDN P60 Procedure
6	No	Yes	IDN P60 Procedure

All unlisted encoder types are not supported. For encoder types 0 and 1, the "find index marker" procedure is only required if the encoder offset (IDN P36) is unknown. When this IDN is modified, the drive will enter a "no-compensation" state, which may be cleared through the reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 6
Default: Motor data (0 if undefined)
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MENCTYPE
Availability:

IDN P38: (32, 806) Encoder/Resolver Relative Phase Offset

Description: Defines the encoder/resolver phase relative to the "standard" commutation table. This IDN can be used to compensate for resolver offset and should be set to 0 when no resolver offset is present. Modifying the phase offset will not change the value of the absolute mechanical position relative to the marker (IDN P64) or the feedback hardware counter (IDN P63), nor will a modification create a physical change in the position of the motor shaft.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 359
Default: Motor data.
Units: Electrical degrees.
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MPHASE
Availability:

IDN P39: (32, 807) Number of Resolver Poles

Description: Defines the number of poles within the feedback device and is used for commutation and velocity feedback scaling. When this IDN is modified, the drive will enter a "no-compensation" state, which may be cleared through the reset procedure (IDN 99).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0 (encoder systems),
2 (resolver systems)
Maximum: 60
Default: Motor data.
Units: Individual poles (not pole pairs)
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MRESPOLES
Availability:

IDN P43: (32, 811) Motor Type

Description: Specifies the type of motor the drive is controlling.

Motor Type	Description
0	Permanent magnet rotary motor
1	Reserved Do not use
2	Permanent magnet linear motor

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: MOTORTYPE
Availability:

IDN P56: (32, 824) Hall Sensor Status

Description: Indicates the hall switch values on encoder feedback systems.

Bit	Description
LSB 0	Phase A
1	Phase B
2	Phase C
3	Reserved (set to 0)
4	Reserved (set to 0)
5	Reserved (set to 0)
6	Reserved (set to 0)
7	Reserved (set to 0)
8	Reserved (set to 0)
9	Reserved (set to 0)
10	Reserved (set to 0)
11	Reserved (set to 0)
12	Reserved (set to 0)
13	Reserved (set to 0)
14	Reserved (set to 0)
15	Reserved (set to 0)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: HALLS
Availability:

IDN P59: (32, 827) Encoder Initialization Current

Description: Defines the B-C phase current during the encoder initialization procedure (IDN P60).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 100
Default: 25
Units: Percent of motor I_C (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IENCSTART
Availability:

IDN P60: (32, 828) Procedure: Initialize Encoder

Description: The encoder initialization procedure is used to initialize encoder systems that do not have hall sensors and/or a marker pulse (refer to IDN P37). The initialization process rotates the motor to a known electrical position by placing current (IDN P59) from motor terminal B to motor terminal C. For encoder systems with no halls (encoder types 1 and 3), the drive may not be enabled until this procedure has been started or the motor has been previously rotated to a known electrical position. To initialize the encoder, the master should:

1. Start the procedure with the drive disabled.
2. Wait for the "encoder not initialized" warning bit (IDN 181, bit 5) to go low.
3. Enable the drive. At this point the drive automatically rotates to find a known electrical position.
4. Monitor the procedure change bit and/or the procedure status for
5. completion.
6. Set the position command by reading the drive's feedback (IDN 51).
7. Cancel the procedure.
8. The encoder initialization procedure may fail under the following conditions:
9. If the homing procedure (IDN 148), step procedure (IDN P184), or tune procedure (IDN P188) are active.

The drive is enabled when the procedure starts.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, En
Serial Equivalent: ENCSTART
Availability:

IDN P62: (32, 830) Procedure: Find Marker Encoder Initialization

Description: Determines the distance from electrical zero to the index marker (IDN P36)for encoder based systems that have a marker (IDN P37). For systems that do not have halls, the initialize encoder procedure (IDN P60) must be executed first to determine the electrical zero position. The initialization process requires rotating the motor until the encoder index is found.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4
Serial Equivalent: ENCINIT
Availability:

IDN P63: (32, 831) Position Feedback Hardware Counter

Description: Returns the position feedback directly from the feedback hardware counter. **For resolver-based systems**, the position ranges from 0 to 65,535 counts per electrical revolution. The number of resolver electrical revolutions per mechanical revolution is equal to the number of resolver poles (IDN P39) divided by 2. **For encoder-based systems**, the position is based upon the quadrature pulse input and ranges from –2048 to +2048 counts.

Data Length: 2 bytes
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Counts.
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: HWPOS
Availability:

IDN P64: (32, 832) Absolute Mechanical Position Relative to Marker

Description: Returns the absolute position of the feedback device. The absolute position always ranges from 0 to 65,535 counts per mechanical revolution and the resolution depends upon the feedback resolution (IDN 116). **On encoder-based systems**, IDN P64 does not return meaningful or useful data until the encoder has been initialized. Refer to the encoder type (IDN P37), encoder initialization procedure (IDN P60), and the find marker procedure (IDN P62) for more information on initializing encoder systems.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default:
Units: Counts.
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: PRD
Availability:

IDN P65: (32, 833) Encoder Equivalent Output Resolution

Description: Returns the resolution of the encoder Equivalent output channel. **For encoder-based systems**, the encoder equivalent output resolution may not be modified and is equal to the encoder resolution (IDN 116). **For resolver-based systems**, the encoder Equivalent output resolution may be set to 2048, 4096, 8192, and 16384 counts per revolution.

Encoder equivalent output resolutions of 8192 and 16384 counts per revolution are only available when the bipolar velocity limit (IDN 91) is less than 6100 RPM (resolver resolution equal to 16384 or 65535) on resolver based systems.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum:
Maximum:
Default: 4096
Units: Counts/revolution
Non-Volatile: Yes
Write Access: Resolver: CP 2-4, Encoder: Read-only
Serial Equivalent: ENCOUT * 4
Availability:

IDN P66: (32, 834) Resolver Inter-LSB Mode

Description: Specifies the operational mode of the inter-LSB algorithm. The inter-LSB algorithm interpolates between the least significant bits (LSBs)of the resolver feedback, which improves performance when the resolver resolution is low, the bandwidth is high, and the command velocity is low.

ILSB Mode	Description
0	Algorithm disabled
1	Algorithm enabled for velocity feedback
2	Reserved

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: ILSBMODE
Availability:

IDN P67: (32, 835) Feedback Status

Description: Contains the primary feedback type and the condition that caused a feedback loss fault (IDN 11, bit 5) to occur.

Bit	Description
LSB 0	Resolver line break
1	Resolver to digital converter error bit (following error)
2	Reserved (set to zero)
3	Encoder line break: A/B input
4	Encoder line break: Index input
5	Illegal hall sensor state
6	Sine encoder line break: C/D input
7	Sine encoder A/B lines out of range
8	Sine encoder burst overflow
9	Reserved (set to zero)
10	Reserved (set to zero)
11	Reserved (set to zero)
12	Reserved (set to zero)
13 14 15	Feedback type: 000 = Resolver 001 = Encoder 010 = Sine Encoder 011 = Tachometer

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only.
Serial Equivalent: Status2, word 1 (bits 0 - 12)
Availability:

IDN P72: (32, 840) Fold Back Fault Handling Mode

Description: When the system continuous current or load limit (IDN 114) has been exceeded for too long, the drive enters fold back and sets the overload warning bit (IDN 12, bit 0 and IDN 310). In fold back the drive current is gradually limited (in an exponential fashion) to the system load limit (IDN 114). The amount of time that the drive remains in fold back without issuing a fault, is defined by the fold back mode (IDN P72) and the fold back time (IDN P73).

Mode	Fold Back Fault Handling
0	No fault is issued
1	Issue a fault after the time limit set by IDN P73 has expired
2	Issue a fault immediately upon detection

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: FOLDMODE
Availability:

IDN P73: (32, 841) Fold Back Warning Time

Description: The fold back warning time specifies the amount of time to wait before issuing an over load shut down fault (IDN 11, bit 0) after detecting a system overload (IDN 12, bit 0). The fold back warning time is only valid when the fold back fault handling mode (IDN P72) has been configured to use a programmable warning time (IDN P72 = 1).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 300
Default: 30
Units: Seconds
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: FOLDTIME
Availability:

IDN P77: (32, 845) Dynamic Braking Mode

Description: Sets the mode of dynamic braking operation. See also IDN P78.

Mode	Description
0	No braking operation
1	Brake on fault only
2	Brake on fault and/or drive disable

Faults do not include Over Voltage or Power Stage Faults!

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: STOPMODE
Availability: SERCOS 2.0.0

IDN P78: (32, 846) Dynamic Braking Current

Description: Sets the current command for the braking function. See also IDN P77.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Minimum of IDN 111 and 112
Default: Depends upon IDN 112
Units: 0.1 % of motor I_C (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: ISTOP * DIPEAK/MICONT
Availability: SERCOS 2.0.0

IDN P84: (32, 852) Bipolar Torque Limit 2

Description: Defines the maximum torque limit in both the clockwise and counter-clockwise direction when a configurable input mode (IDNP123, P125, or P127) is 8 and the corresponding configurable input (IDN P124, P126, or P128) is set. Otherwise, the bipolar torque limit (IDN 92) defines the maximum torque limit in both directions.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: Minimum of IDN 109 and IDN 110.
Default: 0.1 * Minimum of IDN 109 and IDN 110.
Units: 0.1 % of motor I_C (IDN 111)
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: ILim2 * DIPEAK/MICONT
Availability:

IDN P85: (32, 853) Motor Over Speed Trip Set Point

Description: Exceeding the motor over speed set point causes a motor over speed fault (IDN 129, bit 9). The default value is 20% above the maximum system velocity (IDN 91 maximum value), but the set point may be reduced by the master for system protection.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 10
Maximum: IDN 91 maximum value * 1.2
Default: IDN 91 maximum value * 1.2
Units: RPM
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: VOSPD
Availability:

IDN P87: (32, 855) Quick Deceleration Rate

Description: Defines the drive's deceleration (negative acceleration) limit under the following conditions: position limits are encountered, a fault has occurred, or the master has requested an active disable. The quick deceleration rate is always used by the drive when those conditions occur and is independent of the acceleration or deceleration limit enable (IDN P88). Presently, the drive does not support MDT control bit 13 (halt/restart), so clearing MDT control bit 13 causes an active disable at the quick deceleration rate followed by a torque release.

Data Length: 4 bytes
Data Type: Integer
Minimum: -1000
Maximum: -32,767,000
Default: -5,000,000
Units: RPM/second
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: DECSTOP * -1000
Availability:

IDN P88: (32, 856) Acceleration/Deceleration Limit Enable

Description: Enables or disables the use of acceleration (IDN 136) or deceleration (IDN137) ramp limits. The ramp limit enable is associated with IDN 136 and IDN 137 and does not affect motor deceleration under the following conditions: position limits are encountered, a fault has occurred, or the master has requested an active disable.

Under these conditions, the quick deceleration rate (IDN P87) is always used as the ramp limit, independent of the ramp limit enable setting. Presently, the drive does not support MDT control bit 13 (halt/restart), so clearing MDT control bit 13 causes an active disable at the quick deceleration rate followed by a torque release.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0 (ramp limits disabled)
Maximum: 1 (ramp limits enabled)
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: PROFMODE
Availability:

IDN P89: (32, 857) Velocity Loop APP Input Filter

Description: Defines the filter at the input of the advanced pole placement (APP) velocity controller. The array represented by this IDN includes five integers that represent the polynomial coefficients, and two shift parameters, one that scales each polynomial. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The APP controller is not updated until the “design APP velocity controller” procedure (IDN P105) is executed successfully.

The array contents have the following definition:

Array Element	Description	Element Range
1,2,3,5,6	Polynomial coefficients	-32,768 to 32,767
4, 7	Polynomial coefficient shift factor	0 to 32,767

Data Length: 2 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: 1 0 0 0 0 0 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: VFI
Availability: SERCOS 2.0.0

IDN P90: (32, 858) Velocity Notch Filter Center Frequency

Description: Sets the center frequency of the notch filter used in the velocity loop. This IDN only affects the system when the velocity loop filter mode (IDN P93) is 3 and the advance pole placement velocity loop compensation mode (IDN P96) is inactive.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 30
Maximum: 1000
Default: 500
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: NOTCHHZ
Availability:

IDN P91: (32, 859) Velocity Notch Filter Band Width

Description: Sets the bandwidth, measured at the 3 dB points, of the notch filter used in the velocity loop. This IDN only affects the system when the velocity loop filter mode (IDN P93) is 3 and the advance pole placement velocity loop compensation mode (IDN P96) is inactive.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 100
Default: 1
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: NOTCHBW
Availability:

IDN P92: (32, 860) Velocity Feedback Compensation Filter

Description: Enables or disables the use of a 400 Hz low pass filter in the velocity feedback loop. This IDN only affects the system when the high frequency SPP velocity loop compensation mode (IDN P96) is inactive.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0 (LPF disabled)
Maximum: 1 (LPF enabled)
Default: Based upon hardware
Units:
Non-Volatile: No
Write Access: CP 2-4
Serial Equivalent: COMPFILT
Availability:

IDN P93: (32, 861) Velocity Loop Filter Mode

Description: Specifies the type and number of filters that affect the PI, PDFF, and SPP velocity loop controllers. The filters are not used when the APP velocity loop controller is active. The velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Mode	Description
0	No filtering
1	A single first order low pass filter. The cutoff frequency is defined though IDN P94
2	Two first order low pass filters. The cutoff frequencies are defined through IDN P94 and IDN P95
3	Notch filter. The center frequency is selected through IDN P90. The bandwidth is selected through IDN P91

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 3
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: FILTMODE
Availability:

IDN P94: (32, 862) Velocity Low Pass Filter 1 Frequency

Description: Sets the cut-off frequency of the first low pass filter used in the velocity loop. This IDN only affects the system when the velocity loop filter mode (IDN P93) is 1 or 2 and the advance pole placement velocity loop compensation mode (IDN P96) is inactive.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 20 Hz steps
Maximum: 800 in 20 Hz steps.
Default: 500
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: LPFHZ1
Availability:

IDN P95: (32, 863) Velocity Low Pass Filter 2 Frequency

Description: Sets the cut-off frequency of the second low pass filter used in the velocity loop. This IDN only affects the system when the velocity loop filter mode (IDN P93) is 2 and the advance pole placement velocity loop compensation mode (IDN P96) is inactive.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 20 Hz steps
Maximum: 800 in 20 Hz steps.
Default: 500
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: LPFHZ2
Availability:

IDN P96: (32, 864) Velocity Loop Compensation Mode

Description: Defines the type of velocity loop controller used by the drive.

Mode	Velocity Loop Controller	Loop Variables
0	Proportional Integral (PI)	IDN 100 Velocity loop PI proportional gain IDN P103 Velocity loop PI integral gain
1	Pseudo Derivative Feedback with Feed Forward (PDFF)	IDN P97 Velocity loop PDFF proportional gain IDN P98 Velocity loop PDFF integral gain IDN P99 Velocity loop PDFF to feedback gain ratio
2	Low Frequency Standard Pole Placement (SPP)	IDN P23 Motor rotor moment of inertia IDN P100 Velocity loop SPP bandwidth (=200 Hz) IDN P101 Velocity loop SPP load to motor inertia ratio IDN P102 Velocity loop SPP tracking factor
3	Advanced Pole Placement (APP)	IDN P89 Velocity loop APP input filter IDN P105 Procedure: Design APP velocity controller IDN P106 Velocity loop APP forward path polynomial IDN P107 Velocity loop APP feedback path polynomial IDN P108 Velocity loop APP feed forward path polynomial IDN P109 Velocity loop APP output filter
4	High Frequency Standard Pole Placement (SPP)	IDN P23 Motor rotor moment of inertia IDN P100 Velocity loop SPP bandwidth (=400 Hz) IDN P101 Velocity loop SPP load to motor inertia ratio IDN P102 Velocity loop SPP tracking factor

Successfully executing the tune procedure may modify the velocity loop variables.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 4
Default: 2
Units:
Non-Volatile: Yes
Write Access: CP 2-4
Serial Equivalent: COMPMODE
Availability:

IDN P97: (32, 865) Velocity Loop PDFF Proportional Gain

Description: Defines the velocity loop proportional gain for the "pseudo derivative feedback with feed forward" velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1,000,000,000
Default: 1000
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: KV
Availability:

IDN P98: (32, 866) Velocity Loop PDFF Integral Gain

Description: Defines the velocity loop integral gain for the "pseudo derivative feedback with feed forward" velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 65,535
Default: 1000
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: KVI
Availability:

IDN P99: (32, 867) Velocity Loop PDFF to Feedback Gain Ratio

Description: Defines the velocity loop feed forward to feedback gain ratio for the "pseudo derivative feedback with feed forward" velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1000 ?100 %
Default: 0
Units: Percent * 0.1
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: KVFR
Availability:

IDN P100: (32, 868) Velocity Loop SPP Bandwidth

Description: Defines the velocity control loop bandwidth for the SPP velocity loop controllers. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 10
Maximum: 200 (low freq SPP),
400 (high freq SPP)
Default: 20
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: BW
Availability:

IDN P101: (32, 869) Velocity Loop SPP Load to Motor Inertia Ratio

Description: Defines the velocity loop's estimated load moment of inertia relative to the motor's moment of inertia. This IDN is used to design the velocity SPP controllers. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 10,000
Default: 0
Units: % of the motor inertia (IDN P23)
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: LMJR
Availability:

IDN P102: (32, 870) Velocity Loop SPP Tracking Factor

Description: Defines the velocity loop's damping factor for the SPP velocity loop controllers. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). As the damping factor approaches zero, the system's overshoot is diminished while sacrificing some tracking ability. As the damping factor approaches 200, the system may overshoot more but will have improved steady state tracking ability.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 200
Default: 100
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: TF
Availability:

IDN P103: (32, 871) Velocity Loop Integral Gain

Description: Defines the velocity loop integral gain for the proportional-integral velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 65,535
Default: 20
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GVI
Availability:

IDN P104: (32, 872) Velocity Loop Expanded Proportional Gain

Description: Defines the velocity loop proportional gain for the proportional-integral velocity loop controller. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The least significant 16 bits of IDN P104 are duplicated within IDN 100.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1,000,000,000
Default: 500
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GV
Availability:

IDN P105: (32, 873) Procedure: Design APP Velocity Controller

Description: This procedure is used to tune the drive for the APP mode (IDN P96, mode 3). With the APP algorithm utilized in the drive, the interaction of the variables is too dramatic to allow variables to be changed one by one. Therefore, as pole placement algorithm IDNs are written, the new values are buffered without changing the actual values used by the control loops. Once all desired new values have been acquired, the operator runs "design APP velocity controller" procedure, and all parameters of APP mode are written to the control loops simultaneously.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0

Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent: REFRESH
Availability: SERCOS 2.0.0

IDN P106: (32, 874) Velocity Loop APP Forward Path Polynomial

Description: Defines the velocity loop APP controller's forward path polynomial. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The APP controller is not updated until the "design APP velocity controller" procedure (IDN P105) is executed successfully. The array contents have the following definition:

Array Element	Description	Element Range
1	Polynomial coefficients.	-32,768 to 32,767
2	Polynomial coefficients.	-32,768 to 32,767
3	Polynomial coefficients.	-32,768 to 32,767
4	Polynomial coefficients.	-32,768 to 32,767
5	Polynomial coefficients.	-32,768 to 32,767
6	Polynomial coefficient shift factor.	0 to 15

Data Length: 2 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: 0 0 0 0 0 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: VD
Availability: SERCOS 2.0.0

IDN P107: (32, 875) Velocity Loop APP Feedback Path Polynomial

Description: Defines the velocity loop APP controller's feedback path polynomial. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The APP controller is not updated until the "design APP velocity controller" procedure (IDN P105) is executed successfully. The array contents have the following definition:

Array Element	Description	Element Range
1, 3, 5, 7	Polynomial coefficients.	-2,147,483,647 to 2,147,483,647
2, 4, 6, 8	Polynomial coefficient shift factor.	0 to 32,767

Data Length: 4 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: 0 0 0 0 0 0 0 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: VH
Availability: SERCOS 1.7.6

IDN P108: (32, 876) Velocity APP Feed-forward Path Polynomial

Description: Defines the velocity loop APP controller's feed-forward path polynomial. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The APP controller is not updated until the "design APP velocity controller" procedure (IDN P105) is executed successfully. The array contents have the following definition:

Array Element	Description	Element Range
1, 3, 5	Polynomial coefficients.	-2,147,483,647 to 2,147,483,647
2, 4, 6	Polynomial coefficient shift factor.	0 to 32,767

Data Length: 4 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: 0 0 0 0 0 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: VR
Availability: SERCOS 1.7.6

IDN P109: (32, 877) Velocity Loop APP Output Filter

Description: Defines the filter at the output of the APP velocity controller. The array represented by this IDN includes five integers that represent the polynomial coefficients, and two shift parameters, one that scales each polynomial. The type of velocity loop controller is selected through the velocity loop compensation mode (IDN P96). The APP controller is not updated until the "design APP velocity controller" procedure (IDN P105) is executed successfully. The array contents have the following definition:

Array Element	Description	Element Range
1,2,3,5,6	Polynomial coefficients	-32,768 to 32,767
4, 7	Polynomial coefficient shift factor	0 to 32,767

Data Length: 2 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: 1 0 0 0 0 0 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: VF
Availability: SERCOS 2.0.0

IDN P110: (32, 878) Micro-Interpolator Mode

Description: The drive's fine µI generates intermediate commands at the position loop servo rate by curve fitting a cubic spline between the commands sent by the master every CUCT (IDN 1). Therefore, when the µI is active, the drive expects the master to generate command data one time step CUCT ahead of its actual use. The µI mode (IDN P110) specifies whether the µI is enabled and the type of integration technique used by the µI to generate intermediate position, velocity feed forward, and acceleration feed forward commands. The master should match the µI algorithm with its own coordinate generation algorithm to ensure that the resulting motion is smooth.

In order to have the µI active, position and velocity commands (IDNs 36 and 47) must be assigned as cyclic data within the MDT telegram. The CUCT must be no greater than 6 mS. In addition, the control unit synchronization bit - MDT control word, bit 10 (CUSB) monitoring must be enabled (IDN P152) if the CUCT
(IDN 1) differs from the CCT (IDN 2). If the µI mode is non-zero then these conditions must be met in order to successfully execute the CP2 to CP3 transition procedure (IDN 127).

Mode	Description
0	µI inactive.
1	Trapezoidal rule integration algorithm
2	Zero order hold (delay)
3	Forward difference integration algorithm

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 3
Default: 0

Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability:

IDN P115: (32, 883) Acceleration Feed Forward Gain 2

Description: Defines a multiplier of the acceleration command, which is generated by the position profile, that is fed through the velocity loop in order to reduce the acceleration dependent following error.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: -10,000 to -1000.0 %
Maximum: 10,000 to 1000.0 %
Default: 0

Units: 0.1%
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPAFR2
Availability:

IDN P116: (32, 884) Position Loop Derivative Gain

Description: Defines the position loop derivative gain for the proportional-integral-derivative position loop controller. Setting the derivative gain to 1,000 results in unity gain on the derivative term.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 32,767
Default: 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPD
Availability:

IDN P117: (32, 885) Position Loop Integral Gain

Description: Defines the position loop integral gain for the proportional-integral-derivative position loop controller. When the integral gain is set to 10,000 then the integral gain equals the proportional gain (integral term: GP * GPI/10000).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 10,000
Default: 0

Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPI
Availability:

IDN P118: (32, 886) Position Loop Integrator Input Saturation Limit

Description: Limits the input of the position loop integrator by setting the input saturation. When used with the integrator output saturation limit (IDN P119), the master is able to make the position loop integrator effective only near the target position and the integrator is not dominant in the loop dynamics farther from the target position.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1,000,000
Default:

Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPISATIN
Availability:

IDN P119: (32, 887) Position Loop Integrator Output Saturation Limit

Description: Limits the output of the position loop integrator by setting the output saturation. When used with the integrator input saturation limit (IDN P118), the master is able to make the position loop integrator effective only near the target position and the integrator is not dominant in the loop dynamics farther from the target position.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1,000,000
Default: 0
Units: Counts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: GPISATOUT
Availability:

IDN P120: (32, 888) Drive DIP Switch Status

Description: Retrieves the settings of the DIP switches located on the top of the drive. Switch 10 is closest to the 7 segment LED display. If a DIP switch is vertical, when facing the front of the drive, then its logic level is 0 (low). If a DIP switch is leaning to the right, when facing the front of the drive, then its logic level is 1 (high).

Bit	Switch	Description	Setting
LSB 0	1	SERCOS address	LSB of SERCOS address
1	2		Bit 1 of SERCOS address
2	3		Bit 2 of SERCOS address
3	4		Bit 3 of SERCOS address
4	5		MSB of SERCOS address
5	6	SERCOS/Serial baud rate	0 = 2 MBits/S (SERCOS) 9600 baud (Serial) 1 = 4 MBits/S (SERCOS) 19200 baud (Serial)
6	7	Hold Mode	0 = Disabled 1 = Enabled
7	8	Drive Disable	0 = Enable 1 = Disable
8	9	SERCOS transmitter power	0 = Low 1 = High
9	10	Firmware load.	0 = Normal operations1 = Ember
10		Reserved	Set to 0
11		Reserved	Set to 0
12		Reserved	Set to 0
13		Reserved	Set to 0
14		Reserved	Set to 0
15		Reserved	Set to 0

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: DIP
Availability:

IDN P121: (32, 889) DIP Switch Enable Status

Description: Indicates the DIP switch enable status. This IDN must be 1 (DIP switch 8 off or low) in order for the drive to be enabled by the master. IDN P121 may be assigned to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: DIPEN
Availability:

IDN P122: (32, 890) Remote Enable Switch Status

Description: Indicates the state of the external hardware enable input signal. IDN P122 must be 1 in order for the drive to be enabled by the master. IDN P122 may be assigned to a RTS bit.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: Yes
Write Access: Read-only
Serial Equivalent: REMOTE
Availability::

IDN P123: (32, 891) Configurable I/O: Input 1 Mode

Description: Sets the functionality of digital input 1 which may be read through IDN P124. The following functions are available:

Mode	Description
0	No special function
1	CW limit switch (IDN P136)
2	CCW limit switch (IDN P137)
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Second bipolar torque limit (IDN P84)
9	Reserved
10	Home switch (IDN 400)
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved
16	Probe input (IDN 401)
17	Reserved
18	Open fault relay. Refer to IDN P138

Except for mode 0, each function may only be assigned to one digital input. Mode 18 adds an external signal to the fault relay safety chain.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 1
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IN1MODE
Availability::

IDN P124: (32, 892) Configurable I/O: Input 1 Status

Description: Returns the state of digital input 1 located on user connector C3, pin 9. A '1' indicates that the digital input is on or is conducting current. IDN P124 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: IN1
Availability::

IDN P125: (32, 893) Configurable I/O: Input 2 Mode

Description: Sets the functionality of digital input 2 which may be read through IDN P126. The following functions are available:

Mode	Description
0	No special function
1	CW limit switch (IDN P136)
2	CCW limit switch (IDN P137)
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Second bipolar torque limit (IDN P84)
9	Reserved
10	Home switch (IDN 400)
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved
16	Probe input (IDN 401)
17	Reserved
18	Open fault relay. Refer to IDN P138

Except for mode 0, each function may only be assigned to one digital input. Mode 18 adds an external signal to the fault relay safety chain.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 1
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IN2MODE
Availability::

IDN P126: (32, 894) Configurable I/O: Input 2 Status

Description: Returns the state of digital input 1 located on user connector C3, pin 10. A '1' indicates that the digital input is on or is conducting current. IDN P126 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: IN2
Availability::

IDN P127: (32, 895) Configurable I/O: Input 3 Mode

Description: Sets the functionality of digital input 3 which may be read through IDN P128. The following functions are available:

Mode	Description
0	No special function
1	CW limit switch (IDN P136)
2	CCW limit switch (IDN P137)
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Second bipolar torque limit (IDN P84)
9	Reserved
10	Home switch (IDN 400)
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved
16	Probe input (IDN 401)
17	Reserved
18	Open fault relay. Refer to IDN P138

Except for mode 0, each function may only be assigned to one digital input. Mode 18 adds an external signal to the fault relay safety chain.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 1
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: IN3MODE
Availability::

IDN P128: (32, 896) Configurable I/O: Input 3 Status

Description: Returns the state of digital input 3 located on user connector C3, pin 11. A '1' indicates that the digital input is on or is conducting current. IDN P128 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: IN3
Availability::

IDN P131: (32, 899) Configurable I/O: Output 1Mode

Description: Sets the functionality of digital output 1 which may be read through IDN P132. The following functions are available:

Mode	Description
0	No special function. The master may directly modify the output through IDN P132
1	Reserved
2	Reserved
3	Output on when the drive is in fold back (IDN 12, bit 0)
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Reserved
9	Reserved
10	Output on if the drive is enabled

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 10
Default: 6
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: O1MODE
Availability::

IDN P132: (32, 900) Configurable I/O: Output 1 Control/Status

Description: Allows the master to read the state of digital output 1 located on user connector C3, pin 12. A '1' indicates that the digital output is on or is conducting current. IDN P132 is write protected whenever the digital output 1 mode (IDN P131) is non-zero.

Data Length: 2 bytes
Data Type: Binary
Minimum: No
Maximum:
Default:
Units:
Non-Volatile:
Write Access: CP 2-4, EN (when IDN P131 is 0)
Read-only (when IDN P131 is non-zero)
Serial Equivalent: O1
Availability::

IDN P135: (32, 903) Hardware Limit Switch Enable/Disable

Description: Enables or disables the use of the hardware limit switches. One or two digital inputs must also be assigned as hardware limit switch inputs through the flexible input mode IDNs P123, P125, or P127 in order for the hardware limit switches to function.

Data Length: 2 bytes
Data Type: Binary
Minimum: 0 (HW limit switches enabled)
Maximum: 1 (HW limit switches disabled)
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: LIMDIS
Availability::

IDN P136: (32, 904) CW Limit Switch Status

Description: Returns the state of the CW (clockwise) limit switch input. A '1' indicates that the CW limit has been reached and the switch is open. And conversely, a '0' indicates that the CW limit has not been reached and the switch is closed. The data returned by IDN P136 is not meaningful unless one of the flexible input mode IDNs P123, P125, or P127 has been assigned as the CW limit switch input (mode 1). IDN P136 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: CWLIM
Availability::

IDN P137: (32, 905) CCW Limit Switch Status

Description: Returns the state of the CCW (counter-clockwise) limit switch input. A '1' indicates that the CCW limit has been reached and the switch is open. And conversely, a '0' indicates that the CCW limit has not been reached and the switch is closed. The data returned by IDN P137 is not meaningful unless one of the flexible input mode IDNs P123, P125, or P127 has been assigned as the CCW limit switch input (mode 2). IDN P137 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: CCWLIM
Availability::

IDN P138: (32, 906) Drive Relay Closure Conditions

Description: Specifies the conditions that will cause the "drive-up / drive ready" relay to open.

Mode	Description
0	Relay closed when no faults exist
1	Relay closed when the drive is enabled
2	Relay closed when the drive is enabled or is above the disable speed threshold while actively disabling

When the drive is actively disabling, mode 2 causes the relay to open when the motor speed is below the disable threshold, whereas mode 1 does not open the relay until the active disable timer has expired. In addition, a digital input is added to the fault relay safety chain through flexible input mode 18 (IDN P123, P125, or P127).

The relay opens when one or more of the following conditions occurs:

- A fault exists.
- The drive is disabled (IDN P138 is 1).
- The drive is disabled or is actively disabling and is considered stopped (IDN P138 is 2).
- Flexible input mode 18 (IDNs P123, P125, or P127) is active and the corresponding digital input signal goes low.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: RELAYMODE
Availability::

IDN P139: (32, 907) Drive Relay Status

Description: Returns the status of the fault / "drive up" relay. A '1' indicates that the relay is closed and a '0' indicates that the relay is open. IDN P139 may be assigned as a RTS.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: Hardware defined.
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: RELAY
Availability::

IDN P140: (32, 908) Motor Over Temperature Mode

Description: Specifies the operation of the drive when a motor over temperature condition is detected (IDN 312). The amount of time that may elapse, without issuing a C1D fault (IDN 11, bit 2), is defined by the motor over temperature mode (IDN P140).

Mode	C1D Fault	Disable Drive	Open Fault Relay	Notes
0	Immediately	Immediately	Immediately	
1	After 2 minutes	After 2 minutes	Immediately	
2	No	No	Immediately	
3	No	No	No	
4	No	No	No	Warning also issued over RS-232
5	No	No	After IDN P142 time	Warning also issued over RS-232

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 5
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: THERMODE
Availability::

IDN P141: (32, 909) Motor Temperature Sensor Type

Description: Defines the type of motor over temperature sensor.

Type	Description
0	PTC (Positive Temperature Coefficient)
1	NTC (Negative Temperature Coefficient)

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: THERMTYPE
Availability::

IDN P142: (32, 910) Motor Over Temperature Relay Delay Time

Description: Sets the number of seconds the drive will wait after a motor over temperature condition (IDN 312) has occurred before opening the fault relay. The delay time is only used when the motor over temperature mode (IDN P140) is set to 5.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 300
Default: 30
Units: Seconds
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: THERMTIME
Availability::

IDN P144: (32, 912) Bus Under Voltage Fault Handling Mode

Description: Specifies the operation of the drive when a bus under voltage condition is detected. The amount of time that may elapse, without issuing a C1D fault (IDN 11, bit 9), is defined by the motor over temperature mode (IDN P140) and the under voltage warning time (IDN P145).

Mode	Description
0	Issue an immediate under voltage fault
1	Never issue an under voltage fault
2	If the drive is enabled, issue an under voltage fault after the under voltage warning time (IDN P145) has expired

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: UVMODE
Availability::

IDN P145: (32, 913) Bus Under Voltage Warning Time

Description: Sets the number of seconds a bus under voltage condition can be present while the drive is enabled before issuing a fault (IDN 11, bit 9) and shutting down the drive. The delay time is only used when the bus under voltage fault handling mode (IDN P144) is set to 2.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 300
Default: 30
Units: Seconds
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: UVTIME
Availability::

IDN P146: (32, 914) Configurable I/O: Inputs Status

Description: Returns the state of the digital inputs located on user connector C3 (pins 9,10 and 11) as well as the state of the external hardware enable input signal (pin 8). All the signals are represented in inverted form, i.e. a '0' indicates that the digital input is on or is conducting current. IDN P146 may be assigned as AT cyclic data.

Bit	Description
LSB 0	Remote enable switch status (IDN P122)
1	Input 1 status (IDN P124)
2	Input 2 status (IDN P126)
3	Input 3 status (IDN P128)
4	Reserved
5	Not used
6	Not used
7	Not used
8	Not used
9	Not used
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Not used

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: (~REMOTE) | (~IN1<<1) | (~IN2<<2) | (~IN3<<3)
Availability:: SERCOS 2.0.1

IDN P147: (32, 915) Configurable I/O: Inputs Polarity

Description: Allows the master to invert the polarity of the configurable inputs which are located on connector C3 (pins 9,10, and 11). An input signal is inverted if the corresponding bit in IDN P147 is set.

Bit	Description
LSB 0	Input 1 inversion
1	Input 2 inversion
2	Input 3 inversion
3	Reserved (set to 0)
4	Reserved (set to 0)
5	Reserved (set to 0)
6	Reserved (set to 0)
7	Reserved (set to 0)
8	Reserved (set to 0)
9	Reserved (set to 0)
10	Reserved (set to 0)
11	Reserved (set to 0)
12	Reserved (set to 0)
13	Reserved (set to 0)
14	Reserved (set to 0)
15	Reserved (set to 0)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:
Units:
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: ININV1, ININV2, ININV3
Availability:: SERCOS 2.0.6

IDN P150: (32, 918) Manufacturer Class 2 Diagnostic Mask

Description: IDN P150 is used to mask manufacturer-defined warnings (IDN 181) and their effect on the C2D change bit (AT status word, bit 12) and the manufacturer-defined warning summary bit (IDN 12, bit 15). A masked manufacturer warning does not affect the contents of IDN 181, but the C2D change bit and the manufacturer-defined warning summary bit is not effected when the masked warning changes state. When a bit in IDN P150 is clear, then the corresponding bit in IDN 181 is masked.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0xFFFF
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability::

IDN P151: (32, 919) Manufacturer Class 3 Diagnostic Mask

Description: IDN P151 is used to mask manufacturer-defined status signals (IDN 182) and their effect on the C3D change bit (AT status word, bit 11) and the manufacturer defined status signal summary bit (IDN 13, bit 15). A masked manufacturer status signal does not affect the contents of IDN 182, but the C3D change bit and the manufacturer-defined status signal summary bit is not effected when the masked status signal changes state. When a bit in IDN P151 is clear, then the corresponding bit in IDN 182 is masked.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0xFFFF
Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent:
Availability::

IDN P152: (32, 920) Control Unit Synchronization Bit Monitoring

Description: The CUSB must be toggled by the master every CUCT according to SERCOS 7.3.2.3. The CUSB is used to synchronize commands coming from the master with the drive's µI. In addition, the CUSB provides a watchdog on the commands coming from the master. The drive monitors the CUSB in CP4 and issues a manufacturer fault (IDN 129, bits 12 or 13) and returns to CP0 when the CUSB toggles incorrectly.

IDN P152 allows the monitoring of the CUSB to be disabled under certain conditions to support masters that do not toggle the CUSB. CUSB monitoring may be disabled if the drive's µI (IDN P110) is inactive or the CUCT (IDN 1) is equal to the CCT (IDN 2). If the master has disabled CUSB monitoring, by setting P152 to 0 in CP2, and these conditions are not true, then the CP2 to CP3 transition procedure (IDN 127) fails.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 1 (CUSB monitoring active)
Units:
Non-Volatile: No
Write Access: CP 2
Serial Equivalent:
Availability::

IDN P153: (32, 921) Hold Mode Status

Description: If the drive is in a hold mode (IDN 182, bit 1), the condition which caused the drive to enter hold mode has its corresponding bit set to 1 in IDN P153.

Bit	Description
LSB 0	Reserved: Halt/Restart bit low (MDT bit 13)
1	Hold DIP switch (DIP switch 7 = 1)
2	Drive is in an active disable process waiting for the drive off delay time (IDN 207) to expire
3	Hardware limit switch active
4	Configurable input mode 19 active
5	Internal hold request during homing process
6	Reserved (set to zero)
7	Reserved (set to zero)
8	Reserved (set to zero)
9	Reserved (set to zero)
10	Reserved (set to zero)
11	Reserved (set to zero)
12	Reserved (set to zero)
13	Reserved (set to zero)
14	Reserved (set to zero)
15	Reserved (set to zero)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default:

Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: Status word 5
Availability::

IDN P155: (32, 923) APP Velocity Controller Procedure Control

Description: Allows the user to initiate or cancel execution of the "Design APP Velocity Controller" procedure (IDN P105) using the realtime bits. This IDN may be employed to update the APP velocity controller coefficient as fast as possible in realtime rather than using the asynchronous service channel protocol. IDN P155 may be assigned to a RTC.
Structure of the IDN:

Bit	Description
LSB 0	1 – Starts the procedure command execution in the drive (equal to setting IDN P105 to 3) 0 – Cancels the procedure (equal to setting IDN P105 to 0)
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
8	Not used
9	Not used
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Not used

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0

Units:
Non-Volatile: No
Write Access: CP 2-4, EN
Serial Equivalent: REFRESH
Availability:: SERCOS 2.0.8

IDN P156: (32, 924) APP Velocity Procedure Acknowledgement

Description: Bit 0 of the IDN P156 is used for monitoring completion status of the "Design APP Velocity Controller" procedure (IDN P105). Bit 0 is always reset when canceling the procedure command (IDN P105). IDN P156 may be assigned to a RTS.
Structure of the IDN:

Bit	Description
LSB 0	1 – Indicates change in the status of the procedure command (IDN P105) 0 – The procedure command not completed or has not been started
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
8	Not used
9	Not used
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Not used

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:: SERCOS 2.0.8

IDN P160: (32, 928) Scaled Analog Input Value

Description: Contains the scaled analog input, in millivolts, after compensating for offset (IDN P164), dead band (IDN P165), filtering (IDN P166), and analog input circuit attenuation.

Data Length: 2 bytes
Data Type: Integer
Minimum:
Maximum:
Default:
Units: Millivolts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: ANIN
Availability::

IDN P161: (32, 929) Analog Input Value

Description: Returns the Equivalent analog to digital conversion of the analog input signal, as a two's complement number, after compensating for offset (IDN P164), dead band (IDN P165), and filtering (IDN P166).

When the analog offset is 0, the dead band is 0, and the analog input filter is set to 10 kHz, then the analog input voltage in millivolts: Vin = [IDN M161] * 0.75352

IDN P161 may be assigned as AT cyclic data.

Data Length: 2 bytes
Data Type: Integer
Minimum:
Maximum:
Default:
Units: ADC counts
Non-Volatile: No
Write Access: Read-only
Serial Equivalent: AnIn / 0.75352
Availability::

IDN P164: (32, 932) Analog Input Offset Compensation

Description: Defines an offset value that is added to the analog input value (IDN P160 and P161) to compensate for offset or drift.

Data Length: 2 bytes
Data Type: Integer
Minimum: -10,000
Maximum: 10,000
Default: 0
Units: mV
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: AnOff
Availability::

IDN P165: (32, 933) Analog Input Dead Band

Description: If the absolute value of analog input voltage (IDN P160 or P161) is less than the dead band voltage, the analog input value is set to 0.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 10,000
Default: 0
Units: mV
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: AnDB
Availability::

IDN P166: (32, 934) Analog Input Low Pass Filter Corner Frequency

Description: Defines the 3 dB point of a single pole low pass filter for the analog input. The filter gain, at a corner frequency of 10 kHz, is 1.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 10,000
Default: 10,000 (unity gain)
Units: Hz
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: AnLPFHz
Availability::

IDN P170: (32, 938) Source for Analog Output Feature

Description: Sets the source for the analog output feature at user connector C3 pin 13.

Bit	Description
LSB 0	Tachometer (velocity feedback IDN 40) scaled identical to IDN P173
1	I monitor (Equivalent current) scaled identical to IDN P171
2	Velocity Error scaled identical to IDN P173
3	Torque Command Output scaled to IDN P171
4	Reserved
5	Position following error scaled to IDN P172
6	Not used
7	Not used
8	Position feedback (IDN 51) scaled to IDN P172
9	Not used
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Not used

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 8
Default: 0

Units: N/A
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: ANOUT
Availability:: SERCOS 2.0.1

IDN P171: (32, 939) Current Scale Factor for Analog Output

Description: Defines an analog current scale factor that scales the analog output (IDN P170) for modes 1 or 3. The value written is the motor current per 10 volts of analog output. This variable may be either higher or lower than the application current limit (IDN 92), but the actual analog output will be limited by the IDN 92.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: Depends upon IDNs 110 and 111.
Maximum: Depends upon IDNs 110 and 111.
Default: Depends upon IDNs 110 and 111.

Units: 0.1 % of motor I_C (IDN 111) / 10V
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: ISCALE * DIPEAK/MICONT
Availability:: SERCOS 2.0.1

IDN P172: (32, 940) Position Scale Factor for Analog Output

Description: Defines a position scale factor that scales the analog output (IDN P170) for modes 5 or 8. The value written is the motor position movement in counts per 10 volts of analog output.

Data Length: 2 bytes.
Data Type: Unsigned integer
Minimum: 10
Maximum: 2,147,483,647
Default: 2048
Units: Counts per 10 volts
Non-Volatile: Yes
Write Access: CP 2-4, EN
Serial Equivalent: PSCALE
Availability:: SERCOS 2.0.1

IDN P173: (32, 941) Velocity Scale Factor for Analog Output

Description: Defines an analog velocity scale factor that scales the analog output (IDN P170) for modes 0 or 2. The value written is the motor velocity per 10 volts of analog output. This variable may be either higher or lower than the velocity limit (IDN 91), but the actual analog output will be limited by the IDN 91.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 10
Maximum: 32767
Default: Depends upon IDN 91.
Units: RPM / 10 volts
Non-Volatile: Yes
Write Access: CP 2-4, En
Serial Equivalent: VSCALE
Availability:: SERCOS 2.0.1

IDN P180: (32, 948) Step Velocity 1

Description: Specifies one of two velocity commands used by the step procedure (IDN P184). The step velocity 1 command is issued to the velocity controller for the time specified by the step velocity duration 1 (IDN P181).

Data Length: 4 bytes
Data Type: Integer
Minimum:
Maximum:
Default: 100
Units: RPM
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Step argument 2
Availability::

IDN P181: (32, 949) Step Velocity 1 Duration

Description: Specifies the amount of time that the step procedure (IDN P184) issues the step velocity 1 (IDN P180) command to the velocity controller.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 32,767
Default: 1000
Units: milliseconds
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Step argument 1
Availability::

IDN P182: (32, 950) Step Velocity 2

Description: Specifies the second velocity command issued by the step procedure (IDN P184) to the velocity controller to create a square wave step command. The step velocity 2 command is issued to the velocity controller for the time specified by the step velocity duration 2 (IDN P183).

Data Length: 4 bytes
Data Type: Integer
Minimum:
Maximum:
Default: 0
Units: RPM
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Step argument 4
Availability::

IDN P183: (32, 951) Step Velocity 2 Duration

Description: Specifies the amount of time that the step procedure (IDN P184) issues step velocity 2 (IDN P182) command to the velocity controller.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 32,767
Default: 0
Units: milliseconds
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Step argument 3
Availability::

IDN P184: (32, 952) Procedure: Velocity Step

Description: The drive enters an internal velocity mode and automatically performs velocity steps using internally generated square wave velocity commands. This procedure is intended to be used in conjunction with the record procedure (IDN P198) to capture the drive's response while tuning. The step procedure is configured through step velocity 1 (IDN P180), step velocity 1 duration (P181), step velocity 2 (P182), and step velocity 2 duration (IDN P183).

The step procedure fails under the following conditions:

- The drive is disabled or is enabled and moving when the procedure is started.
- The homing procedure (IDN 148), the encoder initialization procedure (IDN P60), or the tune procedure (IDN P188) are active.
- A drive fault is active or is encountered during operation.

The velocity step procedure runs until the requested step has finished (velocity 2 and velocity 2 duration are both zero), the drive is disabled, or the procedure is canceled. When the drive is continuously stepping, the master pauses the procedure before issuing the cancel command. When the step procedure is paused, the drive stops its present motion and holds its position. The master then reads the drive's position feedback and updates its position command appropriately prior to canceling the step procedure.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 4, En
Serial Equivalent: Step
Availability::

IDN P185: (32, 953) Tune Bandwidth

Description: Sets the bandwidth used during the tune procedure (IDN P188).

Data Length: 2 bytes
Data Type: Unsigned Integer
Minimum: 10
Maximum: 100
Default: 10
Units: Hz
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Tune argument 1
Availability::

IDN P186: (32, 954) Tune Rotation Direction

Description: Specifies the motor's direction of rotation (as viewed from the output shaft) during a tune procedure (IDN P188). Under low load inertia conditions, the motor shaft only moves in one direction even with a bi-directional configuration.

Dir	Description
0	Bi-directional
1	Clockwise
2	Counter-clockwise

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 2
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Tune argument 2
Availability::

IDN P187: (32, 955) Tune Velocity

Description: Specifies the motor's maximum speed during the tune procedure (IDN P188). The velocity is always limited to 0.7 of the bipolar velocity limit (IDN 91).

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 350
Maximum:
Default: 500
Units: RPM
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Tune argument 3
Availability::

IDN P188: (32, 956) Procedure: Tune

Description: The drive enters an internal velocity mode and automatically performs velocity steps in closed loop, while maintaining position and velocity constraints, in order to capture the system dynamics and set tuning constants. The tune procedure is configured through the tune bandwidth (IDN P185), tune rotation direction (IDN P186), and the tune velocity (IDN P187).

The tune procedure fails under the following conditions:

- The drive is disabled or is enabled and moving.
- The homing procedure (IDN 148), encoder initialization procedure (IDN P60), velocity step procedure (IDN P184), or the record procedure (IDN P198) is active.
- The tune algorithm was unable to finish, which may be due to current saturation, a motor that cannot rotate, or unsuccessful controller design.
- A drive fault is active or is encountered during operation.

Recommendations on the use of tune:

- Start with a low bandwidth.
- Increase the bandwidth after each successful tuning iteration. (The tune algorithm is more accurate at higher tune speeds.)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP4, En
Serial Equivalent: Tune
Availability::

IDN P189: (32, 957) Record Sample Time

Description: The record sample time defines the time period between consecutively recorded data points. The actual sample time used by the record procedure (IDN P198) is rounded to the nearest 0.5 ms.

Data Length: 4 bytes
Data Type: Unsigned integer
Minimum: 500
Maximum: 5,000,000
Default: 500
Units: Micro-seconds
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Record argument 1
Availability::

IDN P190: (32, 958) Record Channel Buffer Size

Description: The record channel buffer size defines the number of signal samples that are stored on each channel.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 1
Maximum: 1024
Default: 1024
Units: Data points
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Record argument 2
Availability::

IDN P191: (32, 959) Record Channel 1 Signal

Description: Specifies the variable that is recorded on channel 1. Up to four words of data may be recorded among all three channels.

Signal	Description	Size (words)
0	Phase A current	1
1	Phase C current	1
2	Velocity feedback	1
3	Absolute position feedback	1
4	Current loop command	1
5	Velocity loop command	1
6	Motor current	2
7	Analog input	1
8	Configurable input 1	1
9	Configurable input 2	1
10	Configurable input 3	1
11	In position flag	1
12	Position error	2
13	External position feedback	2
14	External velocity feedback	1
15	Profile generator stop flag	1
16	Configurable output 1	1
17	Position command	2
18	Position feedback	2

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 5

Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Record argument 3
Availability::

IDN P192: (32, 960) Record Channel 2 Signal

Description: Specifies the variable that is recorded on channel 2. Up to four words of data may be recorded among all three channels.

Signal	Description	Size (words)
0	Phase A current	1
1	Phase C current	1
2	Velocity feedback	1
3	Absolute position feedback	1
4	Current loop command	1
5	Velocity loop command	1
6	Motor current	2
7	Analog input	1
8	Configurable input 1	1
9	Configurable input 2	1
10	Configurable input 3	1
11	In position flag	1
12	Position error	2
13	External position feedback	2
14	External velocity feedback	1
15	Profile generator stop flag	1
16	Configurable output 1	1
17	Position command	2
18	Position feedback	2

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 2

Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Record argument 4
Availability::

IDN P193: (32, 961) Record Channel 3 Signal

Description: Specifies the variable that is recorded on channel 3. Up to four words of data may be recorded among all three channels. If the word count of the signals assigned to channels 1 through 3 exceed four words, then channel 3 data is not recorded.

Signal	Description	Size (words)
0	Phase A current	1
1	Phase C current	1
2	Velocity feedback	1
3	Absolute position feedback	1
4	Current loop command	1
5	Velocity loop command	1
6	Motor current	2
7	Analog input	1
8	Configurable input 1	1
9	Configurable input 2	1
10	Configurable input 3	1
11	In position flag	1
12	Position error	2
13	External position feedback	2
14	External velocity feedback	1
15	Profile generator stop flag	1
16	Configurable output 1	1
17	Position command	2
18	Position feedback	2

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 18
Default: 18

Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: Record argument 5
Availability::

IDN P194: (32, 962) Record Trigger Signal

Description: Specifies the signal or condition that triggers the recording mechanism to capture data.

Signal	Description	Trigger Level (IDN P195)
0	Absolute position feedback	0 to 65535
1	Phase A current	-32767 to 32767
2	Phase C current	-32767 to 32767
3	Velocity feedback	-32767 to 32767
4	Current loop command	-32767 to 32767
5	Velocity loop command	-32767 to 32767
6	Trigger immediately	Not used
7	Trigger on next serial command	Not used
8	Remote input	Not used
9	CW limit switch	Not used
10	CCW limit switch	Not used
11	Configurable input 1	Not used
12	Configurable input 2	Not used
13	Configurable input 3	Not used
14	Configurable output 1	Not used
15	Position command	-2^32 to +2^32 - 1
16	Position feedback	-2^32 to +2^32 - 1

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 16
Default: 3
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: RecTrig argument 1
Availability::

IDN P195: (32, 963) Record Trigger Level

Description: Specifies the value that the trigger signal (IDN P194) must pass through in order for the recording mechanism to capture data. The trigger level range depends upon the selected trigger signal. Refer to the trigger signal IDN description for range information. The record procedure clips trigger levels that exceed the maximum range to the range limit for trigger signals 0 through 5.

Data Length: 4 bytes
Data Type: Integer
Minimum:
Maximum:
Default: 50
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: RecTrig argument 2
Availability:

IDN P196: (32, 964) Record Trigger Polarity

Description: Specifies the direction the trigger signal (IDN P194) must be changing when it crosses the record trigger level (IDN P195) in order for the recording mechanism to capture data. When a binary signal has been assigned as a trigger signal (signals 8 -14), the trigger polarity specifies the logic level the signal must achieve in order to capture data.

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0 (decreasing)
Maximum: 1 (increasing)
Default: 1
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: RecTrig argument 4
Availability::

IDN P197: (32, 965) Record Trigger Buffer Offset

Description: The trigger buffer offset defines the number of data points stored before the data point that satisfies the data capture conditions (trigger level and polarity).

Data Length: 2 bytes
Data Type: Unsigned integer
Minimum: 0
Maximum: 1023
Default: 0
Units: Data points
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent: RecTrig argument 3
Availability::

IDN P198: (32, 966) Procedure: Record

Description: Captures the data of up to three realtime signals. The following IDNs are used to configure the capture process before the record procedure is started.

- IDN P189 Sample time-defines the time period between consecutive recorded data points
- IDN P190 Channel buffer size - Defines the number of signal samples recorded
- IDN P191 Channel 1 signal
- IDN P192 Channel 2 signal
- IDN P193 Channel 3 signal
- IDN P194 Trigger signal
- IDN P195 Trigger level
- IDN P196 Trigger polarity
- IDN P197 Trigger Offset-determines the amount of data stored before the trigger point

The record procedure runs until the requested data has been captured. After the record procedure returns a successful procedure status, the record data status (IDN P199) indicates which channels have available data. The recorded data must be read from IDN P201 before the record procedure is canceled.

The record procedure fails if the tune procedure is active.

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent:
Availability::

IDN P199: (32, 967) Record Data Status

Description: Indicates the availability of recorded data.

Bit	Field Description
0	1 = Channel 1 data available
1	1 = Channel 2 data available
2	1 = Channel 3 data available
3	Reserved
4	Reserved
5	Reserved
6	1 = Recording data
7	1 = Waiting for trigger
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0

Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability::

IDN P200: (32, 968) Record Data Pointer

Description: Defines the record channel and the starting buffer position of the data contained within the record data IDN (IDN P201).

Bit	Field Description
0	Buffer offset
1	Buffer offset
2	Buffer offset
3	Buffer offset
4	Buffer offset
5	Buffer offset
6	Buffer offset
7	Buffer offset
8	Buffer offset
9	Buffer offset
10	Buffer offset
11	Reserved
12	00 - Channel 1 01 - Channel 2 10 - Channel 3
13	00 - Channel 1 01 - Channel 2 10 - Channel 3
14	Reserved
15	Auto-increment buffer offset after reading record data. (0/1 = off/on)

Data Length: 2 bytes
Data Type: Binary
Minimum:
Maximum:
Default: 0
Units:
Non-Volatile: No
Write Access: CP 2-4, En
Serial Equivalent:
Availability::

IDN P201: (32,969) Record Data

Description: Contains the record data specified by the record pointer (IDN P200). Record data is only available while the record procedure (IDN P198) is active.

Data Length: 4 byte elements.
Variable length array.
Data Type: Integer
Minimum:
Maximum:
Default: Null
Units:
Non-Volatile: No
Write Access: Read-only
Serial Equivalent:
Availability:

Glossary of Terms & Acronyms

Availability Denotes the SERV**OSTAR** drive version for which each IDN is applicable. If no information is displayed, the IDN is considered valid for all versions.

APP Advanced Pole Placement

AT Amplifier Telegram

C1D Class 1 Diagnostic - Fault

C2D Class 2 Diagnostic - Warning

C3D Class 3 Diagnostic - Status

CCT Communication Cycle Time

CCW Counter-Clockwise - CW and CCW are viewed from the output end of the motor.

CP Communication Phase

CUCT Control Unit Cycle Time

CUSB Control Unit Synchronization Bit (MDT Control Word Bit 10)

CW Clockwise - CW And CCW are viewed from the output end of the motor.

Data Length Lists the IDN data element length in bytes. Possible entries for this field are 2, 4, 1 V, 2 V, and 4 V. A 'V' following the number of bytes indicates a variable length data element. For example, "2 V" indicates that the IDN may contain a variable number of 2 byte words.

Data Type Indicates how the data should be interpreted and displayed. Possible entries for this field are binary, integer, unsigned integer, text, and IDN.

Default The default value for element 7 of an IDN. IDNs may assume their default values due to a reset procedure or after a firmware upgrade. A default entry of "motor data" indicates that the default value is determined by a motor data sheet. If an IDN does not have a default value, then the "default" field is not listed within the IDN description.

Description A short explanation of the IDN purpose.

IC Continuous Current

IDN The Identification Number. An IDN preceded by the prefix 'P', specifies a product-specific (manufacturer) IDN in short-hand notation. The actual IDN number for a product-specific IDN, may be obtained by adding 32768 to the short-hand numeric value. For convenience, the actual IDN number is given in parenthesis following the short hand notation. For example, P2 is a manufacturer specific IDN whose actual IDN number is 32770.

IDN Name A descriptive title of the IDN.

IP Peak Current

LSB Least Significant Bit

Maximum This field, together with minimum, indicates the range of IDN element 7 data. In general, IDN elements 5 and 6 are not supported if the range fields are not listed within the IDN description. The ranges of some IDNs are dependent upon the value of other IDNs.

MDT	Master Data Telegram
Minimum	This field, together with maximum, indicates the range of IDN element 7 data. In general, IDN elements 5 and 6 are not supported if the range fields are not listed within the IDN description. The ranges of some IDNs are dependent upon the value of other IDNs.
MSB	Most Significant Bit
MST	Master Synchronization Telegram
Non-Volatile	Indicates whether the IDN data may be saved to non-volatile memory. IDN data that resides in non-volatile memory is restored to the IDN upon powering up the drive. IDN data that does not reside in non-volatile memory is assigned default values when the drive is powered-up.
PDFF	Pseudo-Derivative Feed Forward
RTC	Realtime Control Bit
RTS	Realtime Status Bit
Serial Equivalent	Lists an equation of equivalent protocol commands that may be issued through the RS-232/485 serial port to obtain the IDN data. Evaluating the equation results in the contents of the IDN. If no serial equivalent commands are available, then field values are not listed within the description.
SPP	Standard Pole Placement
Units	Specifies the units of IDN element 7 and of the minimum, maximum, and default fields. To obtain the final value of the IDN, multiply the value read from the IDN by the units of the IDN. IDNs with data types of binary, text, or IDNs without units have no units listed with the IDN description.
Write Access	Lists the CPs during which an IDN may be written. In general, an IDN may be read through the service channel during all CPs above CP1. Writing to an IDN may be restricted during some CPs or while the drive is enabled.
µI	Micro-Interpolator